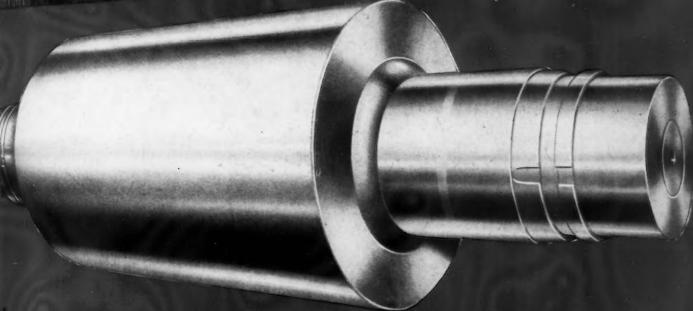
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RON AGE



Ohio Rolls "Bears for Punishment!"



Now, more than ever before, tool production demands rolls hat can stand brutal punishment. Ohio Rolls are proving their ability to stand up under the hardest usage—day a and day out.

SELECT FROM THESE 9 TYPES OF OHIO STEEL AND IRON ROLLS

Carbon Steel Rolls Obloloy "K" Rolls Chilled Iron Rolls Nickel Grain Rolls
Ohiolog Rolls
HOLL-O-CAST Rolls

Donso Iron Rells Moley Rells Flintuff Rells

The Ohio Steel Foundry Co.

LIMA & SPRINGFIELD, OHIO



NGINEERS FOUNDERS

Free enterprise is the only way to constantly higher American living standards



These two, of several Hoskins electric furnaces at the Briggs Manufacturing Company are used to carburize and anneal the rolls shown above. These rolls form structural shapes from flat aluminum strip, and it is important that they show minimum wear. This is accomplished with good steel and good heat-treat-

ment in Hoskins furnaces. . . . The heating units are made of Chromel-A ribbon and are quite easy to renew—but very hard to wear out. Top temperature around 2000° F. The load capacities cover a wide range. The furnaces turn out work that is uniformly good. Full description in Catalog-58.

Hoskins Manufacturing Company, Detroit 8, Michigan.

HOSKINS PRODUCTS

ELECTRIC HEAT TREATING FURNACES • • HEATING ELEMENT ALLOYS • • THERMOCOUPLE AND LEAD WIRE • • PYROMETERS • • WELDING WIRE • • HEAT RESISTANT CASTINGS • • ENAMELING FIXTURES • • SPARK PLUG ELECTRODE WIRE • • SPECIAL ALLOYS OF NICKEL • • PROTECTION TUBES





The whole bombing program which is so effectively smashing away at the war potential of the enemy relies to a great extent on alloy steels developed since the start of the war emergency.

In bombers and fighters both, NE steels are now doing hundreds of vital jobs that were once handled by the old-line alloys. For example, NE 9440, NE 8720, and NE 8630 are being used for vital parts of aircraft engines, frames, and bomb components.

These are, of course, only a few in the long list of places where NE steels are giving an excellent performance in fighting equipment.

A vast amount of research on wartime steels has been done by Bethlehem metallurgists—research that has included the most exhaustive laboratory tests. If you have a problem involving analyses, properties, heat treating, or applications, write Bethlehem Steel Company, Bethlehem, Pa.

BUY MORE WAR BONDS

Office at

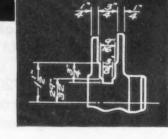


Production

A surprising number of Cincinnati Shapers are on production jobs—they have stepped out of the tool room into the manufacturing shop... Here is a typical example of a Heavy Duty Cincinnati Shaper, using a simple fixture and forming tool, producing with economy and efficiency... There may be a spot in your shop where a Heavy Duty Cincinnati Shaper can be used with profit.

Write for our complete Catalog No. N-2.





THE CINCINNATI SHAPER CO.

CINCINNATI OHIO U.S.A. Shapers · Shears · Brakes



we don't make tea strainers

. . . but we <u>do</u> make them possible.

The lowly tea strainer consumes about 5 million miles of wire a year. It retails for a dime, costs the wholesaler about a nickel—and its profit demands accuracy in every operation.

Where do we come in? With uniform accuracy at the very beginning. We build rolling mills that roll the wire rod at speeds in excess of 4,000 F.P.M., with a uniform cross-section ±.005 in.

MORGAN CONSTRUCTION COMPANY

WORCESTER, MASSACHUSETT

R-125

PLAN NOW WIT

ORGAN

ENGINEERS AND BUILDERS OF ROLLING MILLS... WIRE MILLS...
GAS PRODUCER MACHINES... REGENERATIVE FURNACE CONTROL

THE IRON AGE, June 29, 1944-5

Steel Arteries Molded into

Seventy-three feet of steel tubing, like that shown above at right, are cast integrally within this big engine bed, to form the major part of the engine's oil-line assembly.

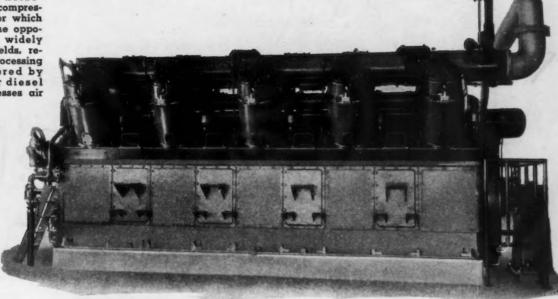
Below: This cutaway view shows how the steel tubing is placed and cast as an integral part of the engine bed.



The Cooper-Bessemer

Twelve-ton Engine Bed

Right: This compact, rugged, 1000 horse-power G-MV compressor, the bed for which is shown on the opposite page, is widely used in oil fields, refineries and processing plants. Powered by either gas or diesel fuel, it compresses air or any gas.



The big, twelve and three-quarter ton engine-driven compressor bed shown on the opposite page illustrates another of the advantages gained by insert molding.

This 19-foot casting has been produced regularly at Cooper-Bessemer's Meehanite foundries for the last eight years, in quantities up to sixteen a month.

The lubricating oil system for the engine's main bearings, comprising 73 feet of steel tubing, is cast integ-

rally with the engine bed. This practice achieves a neat, compact oil-line assembly, and eliminates completely the subsequent operating hazard from broken oil lines and connections.

Thus, advanced foundry practice succeeds in bettering a job normally assigned to machine shop and engine erection crews — and Cooper-Bessemer offers compressor users a better, more dependable enginedriven compressor unit.

Meehanite

MT. VERNON, OHIO, DEPT. C,

ite Foundries

GROVE CITY, PENNA. DEPT. F,



control come within the realm of our laboratory technicians, with automatic regulation that insures parade-ground precision-precise action-long service. No guesswork-Barnes-made Springs are under strict discipline in every stage of manufacture. They obey your orders.

CONSERVE METAL-DESIGN WISELY



WALLACE BARNES COMPANY DIVISION OF ASSOCIATED SPRING CORPORATION BRISTOL, CONNECTICUT, U.S.A.



Get the Slant of your Factory Superintendent!

Weigh the postwar production advantages of Republic Flat Rolled Steel Products

• When V-day starts the rush to get new products on the market, production speed is going to be a vital factor. That's why your Factory Superintendent is interested in the materials you will use.

become

em

ION

ause

He will welcome the many working advantages of Republic Flat Rolled Steel Products. They are suited to mass production—fabricate easily and quickly without difficulty—speed output and keep costs down. They offer steels that are exactly suited to any job requirement, because the line is complete—in analyses, from plain carbon to stainless steel—in form, from light gauge strip to 90-inch-wide plates—and in all commercial finishes.

Your Factory Superintendent will have fewer worries about material deliveries. For Republic provides one source for all flat rolled steel needs—thus speeds ordering and delivery.

Republic has accumulated a wealth of

valuable knowledge on the processing and fabrication of flat rolled steel. And to this has been added war experience in the development and application of new and finer steels. Let it help you.

Start by getting acquainted with Republic Flat Rolled Products and how they can help solve your postwar problems.

REPUBLIC STEEL CORPORATION GENERAL OFFICES . CLEVELAND 1, OHIO

Berger Manufacturing Division
Niles Steel Products Division
Niles Steel Products Division
Steel and Tubes Division
Traws Officer Division
Export Department: Chrysier Bidg., New York N. N. Y.

Note these trade names for tomorrow's use

TONCAN IRON {resists rust and corrosion}

ENDURO STAINLESS STEEL {resists corrosion and beat lustrous and sanitary}

ELECTRO PAINTLOK {takes paint readily—bolds it}

TONCAN ENAMELING IRON {easy to fabricate and enamel}

TAYLOR ROOFING TERNES
{long service proved by
133 years' use}

REPUBLIC SILICON STEEL {bigb-performance electrical steel}

EX-L-ITE TIN PLATE {uniform bigb quality}



SHEETS: Hot and cold rolled—carbon, copper-hearing, alley as I stainless steil—Toncan Iron—electrical, enameling, culvert, galvanised, galvanosaled, cicetro consed, rooting, temes, orea lining, bonderized. © STRP: Hot ned cold relied—colls and tox languas—electrical, carbon, alley and stainless steel—Toncan Iron—France: Universal, mill edge, sheated—carbon, alloy and stainless steel—Toncan Iron—light atmost. © UNIVIATIE: Cost and electrical the cold of the c

BACK OF EVERY ATTACK ...

Preformed wire rope

<u>Preformed</u> wire rope gives sinews of steel to bulldozers that clear the way so jeeps, planes, and trucks can advance. <u>Preformed</u> is in the fight on practically every kind of mobile war machine.

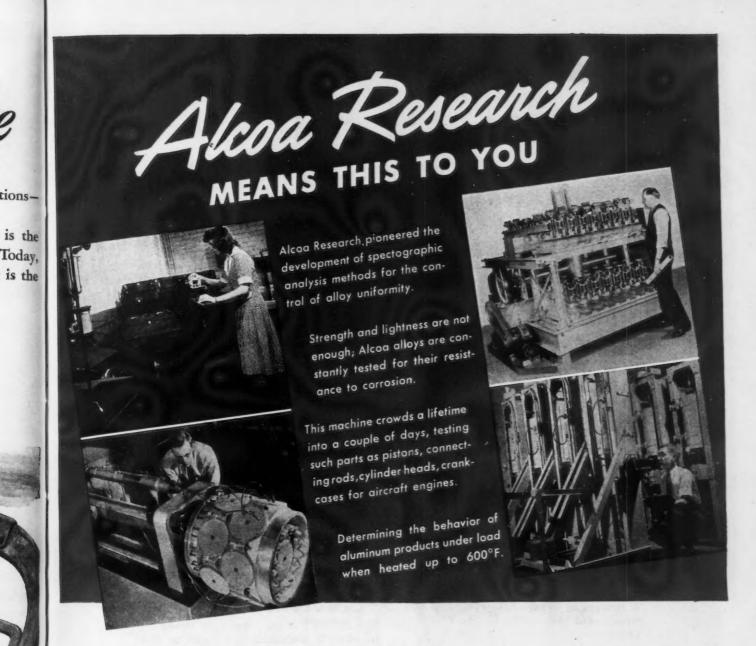
Men who use <u>Preformed</u> wire rope know that it outlasts and outworks ordinary wire rope.

That it handles easier—speeds up operations—safeguards men and equipment.

In the past, <u>Pre</u>formed has proved it is the wire rope for the tough peacetime jobs. Today, back of every attack, it is proving that it is the wire rope for the tough war jobs.



ASK YOUR OWN WIRE ROPE MANUFACTURER OR SUPPLIER FOR PREFORMED WIRE ROPE
10—THE IRON AGE, June 29, 1944



Research carried on by the staff of Aluminum Company of America has won world recognition. Its effect is fundamental and far-reaching.

For example, the manufacturer who buys Alcoa Aluminum products, to include in the devices or equipment he is making, buys more than aluminum castings, forgings, sheet or shapes. Alcoa research helps him determine what alloys will best enable him to meet such requirements as weight saving, corrosion resistance, strength and heat transfer.

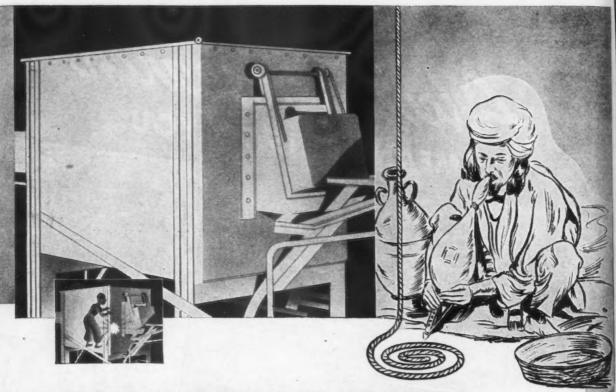
In addition to the careful research done on alloys, Alcoa service goes further. The designs of parts to be made in Alcoa Aluminum are checked for the best method of manufacture, most efficient use of aluminum, and highest possible service characteristics. Parts are produced under close laboratory control, by a manufacturing and research organization whose guiding principle is the constant improvement of Alcoa's output. The performance of each product, as it ultimately affects you, is thereby improved.

These services are hastening the winning of the war by aiding manufacturers of wartime products. They will have an important effect, too, on designers, builders and users of peacetime products. ALUMINUM COMPANY OF AMERICA, 2185 Gulf Building, Pittsburgh 19, Pennsylvania.

ROPE



ALCOA ALUMINUM



ELECTRIC FURNACE BRAZING Modern Production Magic

As the Hindu pipes, the rope rises! So goes the legend. Widely told, it's still but a story.

Electric Furnace Brazing,* equally miraculous, but proved production tool, joins metal to metal, forming one piece. A marvel of today, noteworthy in efficiency and cost-saving for the World of Tomorrow.

We do Commercial Electric Furnace Brazing for the trade. Two modern plants (see addresses below) are ready to help you develop brazed products or sub-assemblies and to braze them for you when they are perfected.

*Also known as Copper Brazing and Hydrogen Brazing.

Arrows Indicate Joint

This is a Photomicrograph (500 Diameters) of a perfect copper brazed steel to steel joint. Note individual crystals formed half on one side of the joint, half on the other. Metallurgically, the joint no longer exists. (Brazing done in Salkover Metal Processing Co, Chicago plant.)

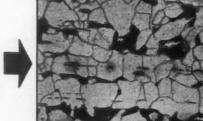
OPERATION: Bring into intimate contact with one another, two-or two thousandsteel parts made on screw machine, punch press or draw bench.

Place copper—the commercial variety—at pre-determined points in the structure.

Pass the assembly through the brazing furnace with proper control of temperature, time and atmosphere.

The RESULT is no longer an assembly. In effect it becomes one piece of steel chemically clean — silvery white. Strength and toughness frequently surpass actual one-piece construction. Subsequent heat treatment is permissible -is in fact standard practice on innumerable parts.

PLEASE CONTACT OUR NEARER PLANT





METAL PROCESSING COMMERCIAL ELECTRIC FURNACE BRAZING

4209 W. LAKE ST., CHICAGO 24, ILL. 34-16 BORDEN AVE., LONG ISLAND CITY 1, N. Y.

DOSE OF SALT



Encrusted with chemical salts, this Tri-Clad motor continues to drive a pump without breakdown of its insulation. In almost every industrial plant, motors are called upon to keep going under conditions which try their endurance to the limit. It may be in a plating room, or on an exhaust fan, or in a wet sub-cellar, or — as in this case — in connection with chemical processing. In emergencies, open motors may face conditions for which good engineering practice would require totally enclosed construction — conditions which tend to corrode the frame and attack the insulation. Endurance of Tri-Clad motors under such conditions results from tests like the one described below.

Salt-spray test of TRI CLAD motors gives assurance of long life in severe service

In this accelerated life test to determine the ultimate endurance of their insulation, the motors are operated to failure under one of the worst possible combinations of conditions. They are continually exposed to a 2% salt-water spray, while operating on a duty cycle of 3 minutes on and 37 minutes off. (These repeated voltage surges impose greater stress on the insulation than would continuous operation.) Tests are run on all new insulations developed, and as a production check on motors taken at random off the assembly lines. Because of their endurance under this severe test, among others, Formex* wire and Glyptal* bonding material were chosen for Tri-Clad insulation.

*Reg. U.S. Pat. Off.



Left: Conical hoods cover the tanks in which these salt-spray tests are conducted.

GENERAL & ELECTRIC

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.





BEFORE YOU ORDER WELDING ELECTRODES

consult Westinghouse

Westinghouse is pleased to announce greatly improved deliveries on electrodes . . . immediate stock shipment on most types.

Among those immediately available is the new ACP electrode which is definitely superior for all-position a-c or d-c reverse-polarity work. While this electrode has been in production and use for considerable time, its announcement to the trade has been withheld pending the building up of present substantial stocks. (See current trade papers for formal announcement.)

Also available for shipment now is the famous DH electrode for high-speed, horizontal fillet and flat welds where high quality is essential. Likewise ready for quick delivery are standard AP (d-c) and FP (a-c or d-c) electrodes.

Wire or phone your nearest Westinghouse office for complete details and definite shipping data. Westinghouse Electric & Manufacturing Company, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-90536



WESTINGHOUSE PRESENTS—JOHN CHARLES THOMAS—SUN, 2:30 E, W. T., N. B, C.—"TOP OF THE EVENING"-MON, WED, FRI. 10:15 E, W. T. BLUE NETWORK



WELDERS - ELECTRODES AND ACCESSORIE

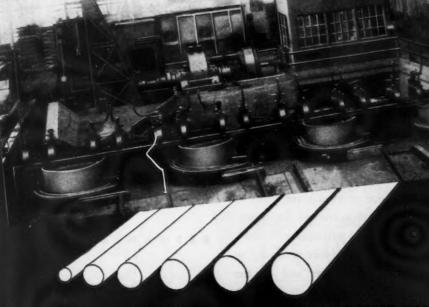
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MERCHANT MILLS

MALINA

Hexibility

ROD MILLS



DUNDRY COMPANY

MANAMA

NEW EASTER, VOUNGSTOWN, CARTON

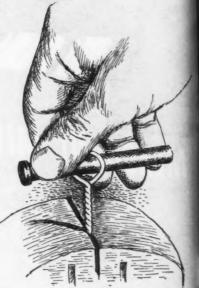
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The select the project Danish are and Miller is the wind letting that Burney

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Bending





... twisting

faze a BETHANIZED coating?

Bethanized wire can be twisted into any conceivable shape . . . bent back flat upon itself . . . even drawn to very fine gage . . . without the slightest

injury to the zinc coating.

Bethanized wire owes its remarkable ability to withstand severe fabrication to the ductility of the bethanized coating. The coating is so ductile, so tightly locked to the steel by the advanced electrolytic process by which it is applied, that for all practical purposes it

is virtually a part of the wire.

The bethanized coating is 99.9+ per cent pure zinc. This, and the fact that the coating is uniform, both around and along the wire, over every part of its surface, makes bethanized wire highly resistant to corrosion. And still greater protection against corrosion can be obtained by using extraheavy coatings. Where conditions warrant, a bethanized coating can be applied twice or even three times as heavy as specifications call for in conventional Type 3 galvanizing.

Today bethanized wire is serving on world-wide battlefronts and on the production front at home . . . providing extra strength for field telephone wire, armoring under-water communication cables, making possible longerlasting zinc-coated cotter pins . . . performing many other essential tasks.

Because of its unusual combination of properties, bethanized wire has many times been assigned to war-related applications in which it had never before been considered zinc-coated wire could be used with success. A multitude of new post-war uses for bethanized wire may be foreseen.

BETHANIZED WIRE



the black widow carries deadly sting



DARK shadow streaks across the night sky. A newcomer enters the A battle on the side of Democracy. Bearing a lethal sting, the Black Widow, America's newest night fighter, packs the power to destroy anything that flies. Swift as an arrow, formidable as its famed namesake, this new ship, designed by Northrop, in co-operation with the Army Air Force's Matériel Command, promises a deadlier weapon to the men who are bringing victory to the United Nations.

And in the Pratt & Whitney engines that drive this most powerful of all pursuit planes are Foote Bros. Gears-gears that of necessity meet new standards in metallurgical and dimensional perfection.

The Black Widow forecasts a new conception of design for the world of tomorrow-an era where high speed, the demand for greater efficiency, will find new uses for high precision gears. The engineering skill, production technique, manufacturing know-hows that have made possible the mass production of gears of such high precision may suggest applications in the development of machines you are designing for a world at peace.



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IRE



in high strength and ductility of cold-upset Monel

A quicker less costly method of turning out strong, corrosion-resistant collar studs was sought.

They were needed for rust-free fastenings on "sub" hulls and heat transfer units where high ductility combined with strength are necessary to meet stresses encountered in this service.

Studs with all the desired mechanical properties could be machined from colddrawn Monel rod. But machining time was high, and scrap loss ran up to 60%.

After considerable study, Harper developed a method for cold-upsetting of hot-rolled Monel rod. The following mechanical properties were observed:

DUCTILITY MEASUREMENT ON HARPER MONEL COLLAR STUDS

(Tests pulled at Technological Institute, Northwestern U. on Baldwin Southwark Machine at rate of 5,000 pounds per minute.)

Total reduction diameter Elongation measured over reduced area 28.3% Tensile strength..... 120,600 p.s.i. The cold-upset Monel studs have mechanical properties comparable to the machined cold-drawn Monel rod. Many materials with properties similar to Monel workharden to brittleness in operations as severe as this cold-forming.

The ductility of Monel...coupled with its strength and corrosion resistance . . . makes it ideally fitted for cold-formed studs, bolts and other fastenings.

Monel may be the answer to some metal problem in your shop or on your drafting board.

Monel is strong. It is tough. It fights corrosion. It is ductile. Monel is invaluable where a combination of these properties is essential.

For further information, write for INCO Technical Bulletin T-1 "Engineering Properties of Monel Bolts." Address:

collar studs by H. M. Harper Co. Chicago, Ill. A specially tooled cold header, powered by 50 h. p. motor exerting approximately 250 tons of energy, produces 50 studs per minute.



Uniform grain flow shows controlled fabrication and homogeneous structure that provides uniform mechanical properties

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

MONEL . "R" MONEL . "K" MONEL . "KR" MONEL "S" MONEL . INCONEL . "Z" NICKEL . NICKEL INCO NICKEL ALLOYS

Sheet...Strip...Rod...Tubing...Wire...Castings

PUMP TIPS FROM ALLIS-CHALMERS-ONE IN A SERIES

How to make SHAFTS Last Longer



THERE YOU HAVE an Allis-Chalmers "Electrifugal" Pump . . . shaft and rotor pictured at left . . . you don't have an alignment problem—because both impeller and rotor are mounted on one shaft.

However, many pumps in use today are coupled to a separate motor, and how well the two are aligned has a lot to do with how long the shaft lasts . . . and the pump and coupling too . . . because misalignment starts all three fighting each other!

Here are a few tips which will help you get longer life out of pump shafts:

- See that pump and motor coupling flanges are parallel . . . both vertically and axially ... and that they are kept that way!
- If misalignment recurs frequently, check foundations, piping, bolted connections.
- In the case of boiler feed or other pumps which reach high operating temperatures, be sure that alignment of motor and pump is checked after both have been operating. Otherwise they might develop misalignment from unequal expansion.
- If you haven't done so already, send for your free copy of "Handbook for Wartime Care of Centrifugal Pumps". Contains no advertising. ALLIS-CHALMERS MFG. Co., MILWAUKEE 1, WISCONSIN.

Tune in the Boston Symphony, Blue Network, every Saturday at 8:30 pm, EWT.

Allis-Chalmers builds all types and variations of pumps shown at right. Capacities from 10 to 150,000 gpm-heads to 2500 lbs.

of Monel

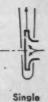
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studs per

WS COR-

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Double Suction Multi-Stage

Open Impeller Mixed Flow

Axial Flow (Propeller)

YOUR OPERATORS, TOO

WILL FIND IT EASIER TO MEET SPECIFICATIONS WITH THESE

PRODUCTION-PROVED ELECTRODES



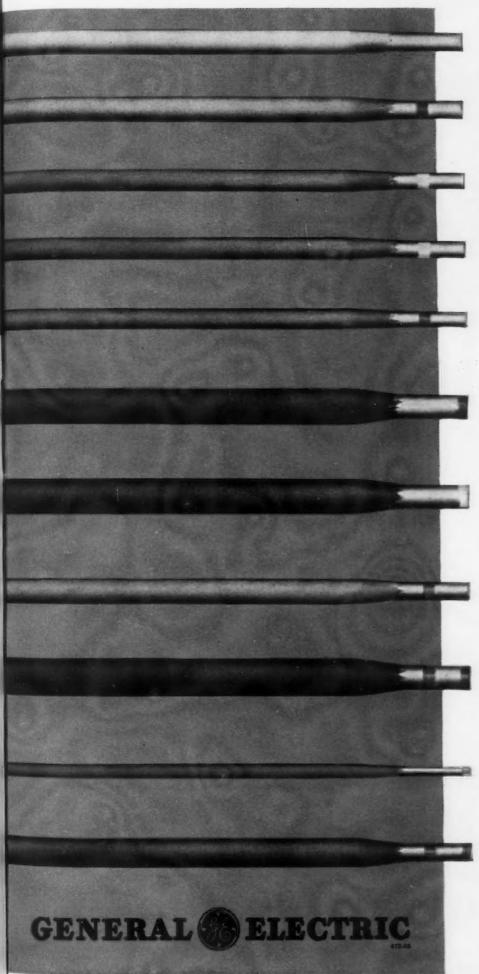
Excellent welding characteristics are assured because each G-E electrode is specifically designed to meet all the requirements of the one A.W.S. classification under which it is listed. No attempt has been made to make any one electrode meet more than one classification, as this invariably requires a sacrifice in performance.

• Once the proper welding procedure is established, the operator can follow it with confidence, knowing that the electrode characteristics will not change. This uniformity of G-E electrode production is maintained by accurately controlled manufacturing and testing procedures.

More Reasons Why the Trend is to G-E Electrodes

- Production data, printed right on the carton, make it easy to estimate weld-footage per pound for typical joints.
- Each electrode is production-proved in G-E factories and is establishing an outstanding performance record in thousands of shops all over the country.
- The complete engineering and research facilities of the General Electric welding laboratory, and a nation-wide organization of top-ranking welding distributors, are available to every user of G-E electrodes.
- For detailed information and samples of General Electric production-labled arc welding electrodes, and for data on G-E arc welders and welding accessories, simply contact your G-E arc welding distributor or the nearest G-E office, or write to General Electric, Schenectady 5, N. Y.

Buy all the Bonds you can—and keep all you buy



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W-22, A.W.S. E6010

For high-quality vertical and overhead welding on mild steel with rev-pol d-c. Deep penetration.

W-26, A.W.S. E6011

For high-quality vertical and overhead welding on mild steel with a-c. Deep penetration.

W-20, A.W.S. E6012

For general all-position welding on mild steel with a-c or straightpolarity d-c. Good for poor fit-up work. Medium penetration.

W-30, A.W.S. E6012

For high-speed welding on mild steel with a-c or straight-polarity d-c. Medium penetration.

W-25, A.W.S. E6013

For welding light-gage mild steel in any position with a-c or straightpolarity d-c. Light penetration.

W-24, A.W.S. E6020

For welding horizontal fillets and flat joints on mild steel with a-c or straight-polarity d-c. Approved for both conventional and deepfillet techniques. Deep penetration.

W-23, A.W.S. E6030

For welding deep-groove joints on mild steel with a-c or straightpolarity d-c. Deep penetration.

W-52, A.W.S. E7010

For high-quality vertical and overhead welding on low-alloy, hightensile steel with reverse-polarity d-c. Deep penetration.

W-54, A.W.S. E7020

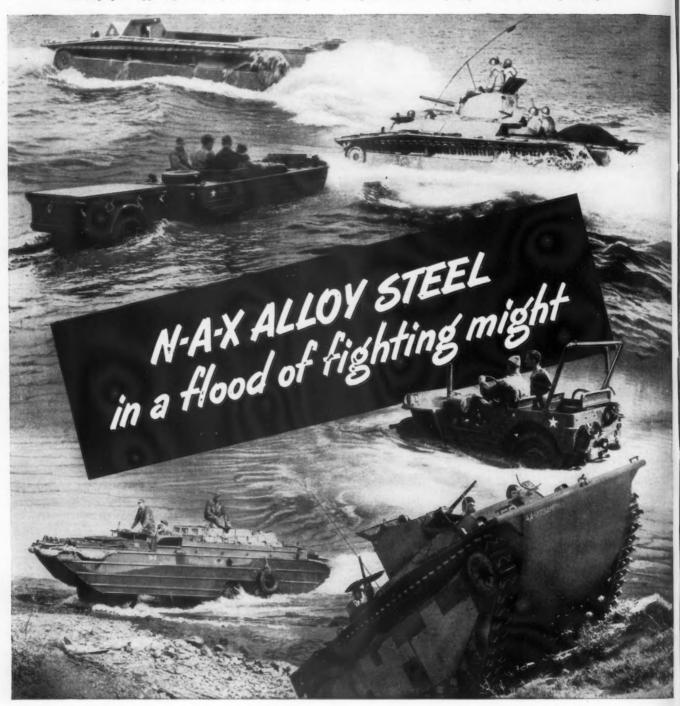
For welding horizontal fillets and flat joints on low-alloy, high-tensile steel with a-c or straight-polarity d-c. Deep penetration.

W-83

For welding cast iron in any position with reverse-polarity d-c or with a-c. Medium penetration.

W-93

For building up wear-resisting surfaces using a-c or reserve-polarity d-c. Medium penetration.



In endless, overwhelming volume, amphibian vehicles made with N-A-X HIGH TENSILE STEEL are rolling on to victory. N-A-X HIGH TENSILE is bred for battle. Its great strength, impact and fatigue resistance, outstanding ductility and weldability are

qualities that have built winners among hundreds of weapons of war. They are the same qualities that will build long life and reduced maintenance into the products of peace . . . Write for the N-A-X HIGH TENSILE and N-A-X 9100 SERIES STEEL book.

GREAT LAKES STEEL CORPORATION



Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION Executive Offices in Pittsburgh, Pa.





... BY THE GISHOLT SIMPLIMATIC

Production cost on one lot cut from \$74 to \$21.50!

"Thanks to Gisholt Simplimatics," said the manufacturer who reported this impressive saving. On switching to Simplimatic Lathes, he saw the output jump almost 50%... costs cut 71%! And the four Simplimatics required only two operators where the previous machines took four!

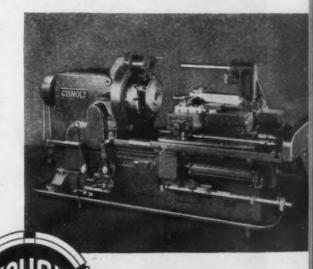
Results like this are to be expected where Simplimatics take over. For these rugged, multiple-cutting lathes are designed to provide the extremely high speed so vital to mass production. Since all operations are completely automatic, one operator can tend several machines.

There you have it—high speed, extreme accuracy, simple operation. If these things are important to you, investigate the Gisholt Simplimatic now. A postcard will bring full particulars.

GISHOLT MACHINE COMPANY

1215 East Washington Ave. • Madison 3, Wisconsin

Look Ahead . . . Keep Ahead . . . with Gisholt Improvements in Metal Turning



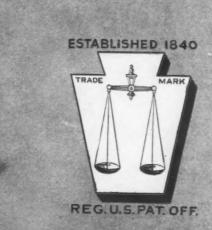
GISHOLT SIMPLIMATICS are built in both Platen and Radial types. Both permit a wide variety of tool arrangements, yet neither requires a high degree of skill from the operator.

OF AIRCRAFT QUALITY
FOR AIRPLANE PARTS

Standard
Standard
Alloy Steel
aroduced by

FOR GUN BARRELS, PARTS

These sturdy, accurate possible are produced in electric tool steel practice experiments furnaces... in precision.



HENRY DISSTON & SONS, INC. 619 Tacony, Philadelphia 35, Pa., U. S. A.

24-THE IRON AGE, June 29, 1944

LET DISSTON EXPERIENCE ASSIST YOUR PLANNING

The experience and background of Disston metallurgists and engineers in the manufacture and application of special tool and carbon steels is exceptionally wide.

Let these experts assist you on any anticipated postwar problems without obligation on your part. Write fully.

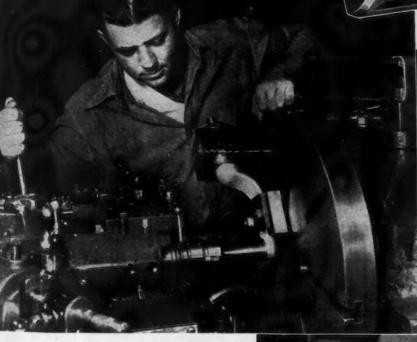
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THREADING EQUIPMENT WILL SOLVE YOUR PRODUCTION PROBLEMS

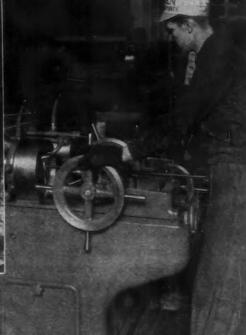
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Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price North America, South America and U. S. Possessions, \$8; Foreign, \$15 a year. Single Capy, 35 cents.

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This Week in The IRON AGE

Vol. 153, No. 26

June 29, 1944

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Majorities and Minorities 29

Technical Articles

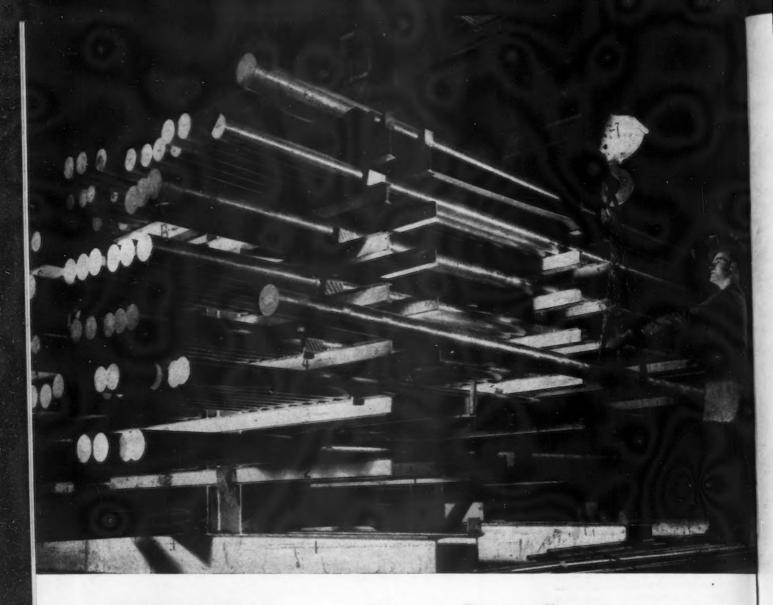
Simplified Method of Contract Cancellation	32
Presses and Processes for Metal Powder Products	36
Metal Spraying Costs Reduced	41
New Designs in Aircraft Dies	
Have Huebner and Huffman Fix Something Up	45
A.S.M.E. Pittsburgh Meeting	51
New Equipment	

Features

News Front								 	ž				
Assembly Line													*
Washington													
West Coast				- ,									
Personals and Obituaries													
Fatigue Cracks												- ,	
Dear Editor													
This Industrial Week	 												
News of Industry													

News and Markets

Small Warplant Pools	79
Warehouses Crowded	80
Off Tolerance Rules Simplified	81
India Steel Outlook	98
Britain Postwar Steel Prospects	102
Contract Settlement School	106
Machine Tool Release Urged	110
Metal Cans and Drums	116
Machine Tool News	118
Non-Ferrous Metals News and Developments	120
Non-Ferrous Metals Prices; Scrap Prices	121
Iron and Steel Scrap News and Prices	123
Comparison of Prices by Year	124
Finished Iron and Steel Prices	125
NE Steel and Warehouse Prices	126
Semi-Finished and Tool Steel Prices	129
Steel Pipe and Tubing Prices	130
Wire Product Prices	131
Pig Iron and Coke Prices	132
Railroad Material and Stainless Steel Prices	133
Ferroalloy Prices	134



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Majorities and Minorities

NCE upon a time, before man was created to make trouble on earth, the animal kingdom was the only one in existence. It did not make war and by and large it followed the precept of "five and let live" with exceptions made only when a member of it was hungry and then only in the case of the meat eaters.

The vegetarians of course minded their own business and did not kill even to eat. Thus nobody ever heard of elephants or hippopotami organizing in gangs to raid their neighbors' premises.

Lions and tigers, of course, together with their other long and sharp toothed relatives did indulge in killing but only when hungry. Whenever a tiger or a lion had his belly full the less powerful species, such as deer and antelope, were perfectly safe in their presence.

This, of course, was in the good old days before the conception of majorities was inflicted upon the world.

Up to that time, the animal kingdom had selected elephants as their rulers, having an inherent respect for age and size and also because elephants perhaps best exemplified the precept of good government expressed in the terms: "He governs best who governs least of all."

After a while, however, there was a change in government in the animal kingdom and a mangy old lion was selected to fill the job. It was an off election year.

The lion did not have the placid "live and let live" disposition of his predecessor. For one thing, fleas bothered him. He was not tolerant. enough to consider that fleas had to eat, just as he did. So he said to himself: "Fleas constitute an insignificant minority in our kingdom, so let's up and at 'em."

So the monkeys were called together and organized into a Gestapo for the purpose of killing off fleas. And with their sharp eyes and nimble fingers they did a pretty good job. However they did not succeed in exterminating them since the fleas had great agility, stick-toitiveness and multiplying power.

Having found it pleasant and politically profitable to pick on minorities, the old lion extended his efforts to other groups which appeared incapable of much resistance. First in line for the new offensive came the bees and the birds and finally it was extended even to minority groups of the four legged animals. Here again, however, the efforts at extermination, while unpleasant for the exterminees, was futile.

Finally came a time when the minorities got tired of being kicked around so they held a meeting. A wise old owl was selected chairman, because he was a deep thinker and a creature of few words. Said he: "In our world, majorities are simply pluralities of minorities. When enough minorities find it expedient to organize for any purpose they can form the majority. There are enough of us now to do that. So let's get busy and do it."

So the small people of the minorities got together and went to town. The fleas bit twice as hard and twice as fast as ever before, the bees stung with new vigor, the birds pecked enthusiastically at eyes and even the ants swarmed over the enemy in such numbers as to make it impossible for him to do anything else but scratch.

So a new majority came into power, headed by the wise owl. His platform was this: Make our land safe for minorities, otherwise it won't be safe for majorities either.

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IRON RGB June 29, 1944

NEWS FRONT

Cynics in Washington opine that sometime in October some means will be found to open the way for pay increases for both industrial and white collar groups.

It may be a roundabout way, as for instance extra pay for night work, and it may approach 15 per cent.

Consumers of iron and steel are showing an inclination to stock steel to anticipate any price increase as the result of a possible wage advance. Already the WPB has sent out notification to pig iron users warning against stocking and pointing out that the war effort is better served by a little excess iron in furnaces' yards rather than in consumers' yards.

▶ Plans for the heavy shell program seem to be changing daily.

Current indications are that consumption may reach 500,000 tons per month by year's end. This is a really terrific quantity of steel, about equal to half that going into shipbuilding. This figure also equals the highest rate of consumption for shells in the 1918 period.

To assure continued and uninterrupted operation of the Andrews Steel Co. it has been reported that the company has been taken over by DPC under a lease which will have DPC pay officials of the company a fixed fee for the operation of the plant.

Inability to make a profit on its production forced the company to close down last week.

- one solution of the West Coast manpower shortage is the Boeing "Tip Plan" whereby all employes who recruit two friends receive a \$25 war bond after the newcomer stays on the job for at least 90 days. The tipster receives a bond for each additional acknowledged hire.
- Pacific Coast shipyards have utilized three million tons of steel in the each of the last two years and now employ 600,000 persons, the Federal Reserve Bank estimates.
- Postwar aluminum price is likely to be around 9c. a lb. with magnesium about the same price per unit of volume or 14c. a lb., Prof. E. B. Parker, superviser of light metals research at Washington State College, foresees.
- ► Surplus aircraft materials may likely eventually be disposed of by steel warehouses acting as sales agents on a consignment-commission basis. Warehouse capacity, being limited, would be supplemented by leasing of military depots.
- Over half of a lot of 400 Japanese artillery shells recently captured were found to be duds. Percentage of duds in American shells usually runs below 2 per cent.
- The Army now has six 700-lb., 50-watt radio broadcasting stations, which can be packed in five trucks, in operation in the China-Burma-India theater. Eight more are planned. Soldier-talent programs are featured, and the stations have "immeasurably improved" morale.
- Jet-propelled bombs have caused far more damage in Britain than has been admitted. This German innovation, an elaboration of the glider bomb used against Allied shipping over the past year, has been pooh-poohed, but like rocket shells they are destined for far greater usage.

The U.S., caught short in the early development of both rockets and jet bombs (and jet aircraft) is swinging far in the lead in the perfection and elaboration of range and weight of all three types of equipment.

Since much bombing is of the "area" or saturation type, there is every reason to believe that jet bombs can develop into one of the most efficient methods of delivering high explosives within a range of several hundred miles, with reasonable accuracy.

The German jet bomb engine has a rather high efficiency because it operates at very high temperature. It has a life expectancy of less than an hour. The engine is very clever, being even simpler in construction and mode of operation than the engine (longer life and more flexible) used in jet aircraft.

The bomb development comes too late to permit its widespread use by the U.S. against Japan.

In Detroit, automotive officials and WPB representatives are hatching a "Junior Priorities" plan for orderly, controlled reconversion. The program is based on studies now being made by OCR as to what constitutes the most necessary civilian goods and services at this time. These would be set up on a controlled priority basis.

Contract Cancellation

T has been said that the subcontractor is the forgotten man in the war production picture. No central governmental organization exists and no standard governmental procedure has been set up to guide him in handling contract terminations swiftly and at minimum loss to all concerned.

The proper handling of contract cancellations has received much attention in the broad reaches of postwar discussion, but very little practical description. There has also been a lack of termination forms and procedures for use by the actual manufacturing departments of the average firm engaged in war production.

The contract termination method used by the Weatherhead Co., Cleveland, should be of interest because in the few months it has been in use it has afforded a simple, practical method for bringing to a halt—promptly and efficiently—all the varied phases of manufacturing and handling in which a war contract may be involved at the moment of receipt of a termination notice.

The largest manufacturer of fittings used in fuel and hydraulic systems for both automotive and aviation equipment, Weatherhead is a subcontractor for hundreds of prime contractors, government procurement agencies, and other customers. With something over 10,000 orders on its books, involving dozens of manufacturing processes, and ranging in size from several dollars to several thousands of dollars, there was ample opportunity for confusion when it became necessary to stop work on any item.

It had been Weatherhead Co. practice to check its backlog of orders past due against cancellations from

. . . The plan developed by the Weatherhead Co. in simplifying the mechanics of contract cancellation is described in detail here. A complete set of forms used is reproduced herein, to enable other companies to benefit by a procedure that has already stimulated a great deal of interest

By HENRY F. BAILEY

Vice-President in Charge of Finance, Weatherhead Co., Cleveland

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customers. From this check it early became apparent that many of its customers were either past due on their own production orders or had made some sizable mistakes in placing orders. In the face of this situation, Weatherhead's own backlog figures were neither realistic nor healthy. Accordingly, a careful study was commenced of major accounts as compared with major cancellations, as a means of relating Weatherhead performance to the production needs and performance of the company's biggest customers, and vice versa.

In general, more mistakes were found to have been made by customers than appeared in Weatherhead's own system, though there was plenty of room for improvement in both. For instance, one prime contractor had received a cancellation on a major item of his own production, and had cancelled his order with Weatherhead-but only in part. Some 30 additional items which the Cleveland company was supplying for the same order remained uncancelled. In this case it was possible to correct the situation by matching up order numbers and other records.

However, the incident illustrated the imperative need for making and continuing an active investigation of the status of all orders to avoid the accumulated errors of overshipments undershipments, and other mistakes natural to the high-pressure production of these times. With Weatherhead Co. production increased five-fold over the company's output for 1940, such errors could easily destroy the value of backlog figures, and of accounts receivable figures, as well.

It was on the basis of the company's own need for careful analysis, therefore, that an effort was initiated to set up workable forms and an effective procedure for contract termination. The method adopted follows closely the Baruch-Hancock recommendations and has proved acceptable both to small customers and to the company's large prime contractors who are the major automotive manufacturers.

First, a form letter with which to acknowledge receipt of a cancellation was drawn up. Then, since it was the practice of each prime contractor, when terminating all or part of a contract, to send out his own sometimes elaborate forms for filing claims, it was necessary to make the Weatherhead procedure as simple and all-inclusive as possible. Otherwise, it was evident that the great variety of forms forthcoming from hundreds

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FIG. 1—Altogether seven work sheets, lettered from "A" to "G" inclusive, are used on each termination. These sheets are generously spaced and printed on heavy paper for filling out in pencil.

of customers would add tremendously to the company's burden of paper work.

Since all claim forms must conform to PR-15, and ask essentially the same questions, it was possible to devise a form for each operating department (see Fig. 1) which would extract from that department the necessary information pertaining to any order.

These "work sheets," as they have been called, are designed individually for the following operating departments:

- (1) Raw material and purchased parts
- (2) Production control
- (3) Finished inventory control
- (4) Tool engineering
- (5) Cancelled materials stock.

Upon receipt of a cancellation from a customer, Weatherhead's termination department sends to each of these departments a printed cancellation notice (Fig. 2) bearing a T (for "termination") number. The receipt of this notice by any department imme-

diately accomplishes two things. First, it stops all shipping, manufacture, material purchases, and tool work involved in any part of the customer's order described on it. Secondly, it starts in each operating department the preparation of all physical data regarding the status of the order at that moment.

The data required are prepared on the work sheets referred to in Fig. 1, which are filled out in pencil and sent to a special collating desk in the company's cost department. The system is so designed that where an operating department has nothing to report regarding the order in question, its copy of the termination order is automatically returned to the collating desk in place of the work sheet. This indicates that the department is not involved in the cancellation in question.

To avoid confusion, the termination order number is the governing factor in assembling the required information, rather than the customer's order number, Weatherhead's own factory order number, or any contract number.

Altogether seven work sheets, lettered from "A" to "G" inclusive, are used on each termination. (See Fig. 1.) Sheets "A" and "B" are reserved for the collating desk which, when it has a complete set of work sheets for any given termination order number, costs the whole and forwards it to the termination department. In this function, sheets "A" and "B" are computation sheets which gather the dollar value of the work.

Up to this point, the collating desk has been a sort of general information center; a point to which the termination manager can refer for the status of any cancelled order. After costing and computation, the termination department's own auditors take over, and check the figures for conformation to Government rulings.

Using the checked and approved pencil figures from the work sheets, the termination department types a set of final claim forms. With one important difference, these new forms follow the make-up of the original work sheets. Whereas the original work sheets are generously spaced and printed on heavy paper for filling out in pencil, the final claim sheets (Fig. 3) are spaced for typewriter fill-in, and are printed on light paper to permit making the maximum number of clear carbon copies.

This arrangement permits an ordi-

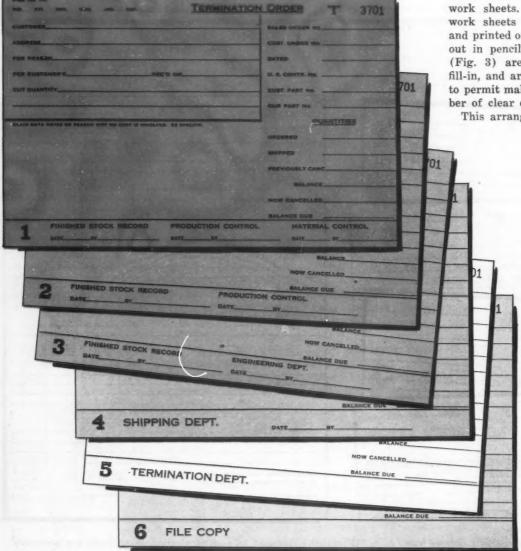


FIG. 2—On receipt of a cancellation from a customer, the termination department sends to each department a printed cancellation notice bearing a T (termination) number. These are the six slips used for this purpose. Each is of a different color, and thin paper is used so that the information on top sheet can be transferred by carbon paper to all the other sheets.

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Quantity Ordered Shipped or Prev. Canc. To be Shipped Cancelled per this Claim ary of Termination Cost on Your Part No From 300 East 1318T STREET CLEVELAND 6, OF I. Row Material C 2. Purchased Parts 3. Work in Process 4. Finished Product on Hand E 5. Tools, Dies, Jigs, Fixtures, etc., not Amerized 6. Other Costs, exclusive of Termination Costs Total Gross Inventory and Other Costs 9. Profit on Work in Process 12. Total Gross Amount of Claim 13. 14. Less Advances and Partial Payments Received Estimated Salvage Value 16. Total Estimated Market Dieposal Value of Materials, Parts, Tools, etc. per Schedule G. 17. Weatherhead Company's Offer for Disposable Items indicated on Schedules C, D, E, F, G 18. Estimated Market Disposal Value Balance of Items The authorized coroline date, is the best of an knowledge and lated, the free going accesses with respect to the subsections and character dangeated dates, prepared for extreme and to Commoning Offices setting in Initial of the United Control, and a intensific in the shares resonancy and statished supporting achievables and suplantations, has been prepared from the basis control, and condening on the controllar extreme and accounting positions, subsidiate, for the counts are subsected up with the most as a controllar extreme and accounting positions, subsidiate, for the counts are understood with the most accounting controllar extreme and the controllar extreme Signed and acknowledged before me this THE WEATHERHEAD COMPANY 194___

F IG. 3—These final claim sheets are spaced for typewriter fillin, and are printed on light paper to permit the maximum number of clear carbon copies.

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*Termination Claim - Sheet C Raw Material -Purchased Parts THE WEATHERHEAD COMPANY BENNET LEGIES ANLE ANLE ANLE CORE CONTROL ASSESSMENT LEGIES OF ASSESSMENT AND ASSESSMENT AND ASSESSMENT AND ASSESSMENT ASSESSMENT AND ASSESSMENT ASSESSMENT AND ASSESSMENT AND ASSESSMENT AS Termination Claim-Sheet D Work in Process THE WEATHERHEAD COMPANY 100 EMP 1310F BREET CLEARLES & 20 MATL LABOR DURSON POTAL CONT Termination Claim—Sheet E Finished Product From THE WEATHERMEAD COMPANY DOG EAST 1816T STREET CLEVELAGE & GOOD me. Termination Claim—Short F Tools, Dim. Jigs. Fintures and Deputy 7004, 660 DRABING MQ. 00 MEN MEET AMORE Termination Claim - Sheet G. Disposal Estimate THE WEATHERHEAD COMPANY
From 200 East 12 for Street: Curyolana & Outo SECOND UNIT VALUE pages pages

Termination Claim Short B General Costs and Profit Computation

From THE WEATHERHEAD COMPANY 300 EAST 1310T STORET CLEVELAND S. On

nary typist, rather than a skilled accountant, to make out final claims from the approved penciled work sheets. It is a simple detail but one which has not only avoided a serious bottleneck, but has saved the company a great deal of time and money.

The Weatherhead Co. has found that its claims for cancelled orders compiled in this way encompass, as well as any customer's more elaborate claim sheets, all the information required; and that they are perfectly acceptable to prime contractors. In

some cases they have been asked to use the customer's own summary or top sheet in place of their own. Otherwise, the company has achieved a simple and uniform standard method of its own which is estimated to save the work of approximately 50 people.

Because the termination procedure is expensive even with a simplified method, The Weatherhead Co. has set an arbitrary dollar sales limit for small orders, below which no processing such as has been described is done. Post-termination expense is ac-

cumulated and charged, provided this expense does not bring the total billing above the original face value of the contract.

The proper filling out of departmental work sheets is guided, of course, by standard practice instructions to each operating department.

Experience to date with the simplified work sheets and termination procedure leads the company to believe that a practical solution to cancellation control and record-keeping has been found.

... Presses and Processes for Metal

OWDER metallurgy is the art of producing metal powders and shaped objects from individual, mixed, or alloyed metal powders, with or without the inclusion of non-metallic constituents, by pressing or forming objects which are simultaneously or subsequently heated to produce a coalesced, sintered, alloyed, brazed, or welded mass, characterized by the absence of fusion, or the fusion of a minor component only. Note that the art is definitely not limited to pure metals as the methods of producing ceramic parts which are largely metal oxides, cutting and drawing dies of metal carbides and abrasives and oxides are inseparable in their similarity.

For present-day purposes, Fig. 1 illustrates the application of the process. An iron powder in the hopper at the right is being automatically weighed in proper charges in cups on the precision scale at the front. The operator pours each charge of powder into the die, levels it prop-

erly, compresses it (the press applies about 25 tons in this case) and then removes the compressed briquette gently. Thereafter, it must be sintered or baked at high temperature in a controlled atmosphere furnace to properly join the particles. While the parts are quite fragile before sintering, their ductility afterwards is well illustrated by the twisted and bent pieces in Fig. 2. The heat treated parts may then be straightened under relatively light pressure as in Fig. 3 or subjected to a high cold flowing or sizing pressure in such a press as in Fig. 4.

Pole pieces of an unalloyed straight iron powder are reported to be of better structural design and more economical to produce than laminated steel pole pieces. They are coming into considerable use for d.c. motors but are unsatisfactory for alternating current due to high eddy current losses. One manufacturer reports using electrolytic iron pressed at about 30 tons per sq. in., then sintered 1½

to 3 hr. at 2400 deg. F. in a hydrogen atmosphere box furnace with Glo-Bar heating elements, and finally sized or coined in hand fed presses. While entire elimination of porosity is not practical, these pole pieces are about 95 per cent of solid, and when sized the tolerances are usually ±0.001 in., which is in line with other press sizing operations (using size blocks or distance pieces to take a substantial part of the load in the dies).

Historical Background

Powder metallurgy was used in Europe at the end of the 18th Century for working the then infusible metal platinum. It is astonishing to find it had been used for the same purpose by predecessors of the Incas in Equador and by the Incas themselves in that locality for a considerable period before Columbus made his famous voyage. Several samples of platinum have been found that had been worked by a process not unlike that used in preparing sintered hard carbides today.

Powder metallurgy was in profitable use by dentists in the middle of the 19th Century. Gold leaf (flake) fillings for teeth are extremely old. The dentist's use of powdered tinsilver alloy mixed with mercury in making amalgam fillings must also be considered as a definite antecedent to the production of solid alloys by diffusion above the melting point of one constituent.

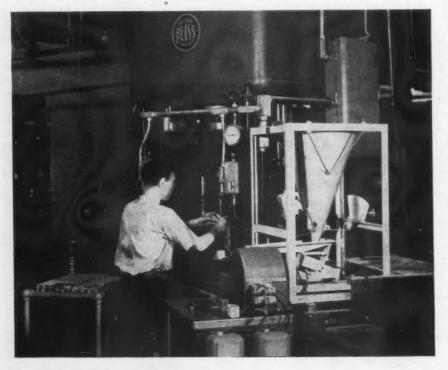
The essential features of powder metallurgy are the production by mechanical or chemical means of a metal powder, and the consolidation of this powder at a temperature below the melting point of the major constituent into a reasonably strong solid form. The coalescence of the particles requires the application of mechanical pressure and (except with metals having a low thermoplastic range) heat.

It may be interesting to know that many metallic elements were first commercially produced in powder form.

Among the metals produced either

FIG. 1—Typifying the process of compacting metal powder products, a self-contained Bliss 200-ton Hydro-Dynamic press is pressing iron powder compacts of an especially difficult shape, averaging 2000 per day. An automatic charge weighing apparatus is shown at the right of the operator.

Photo courtesy American Electro Metal Corp.



Powder Products

By E. V. CRANE and A. G. BUREAU

Development Engineering Department,
E. W. Bliss Co., Brooklyn

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Fe	Iron	C	e Cerium
Co	Cobalt	La	a Lanthanum
Ni	Nickel	N	d Neodymium
Zr	Zirconium	D	
Cb	Niobium	Ta	
Mo	Molybdenum	W	
Ru	Ruthenium '	0	
Rh	Rhodium	Ir	Iridium
Pd	Palladium	Pi	
Ba	Barium	TI	
	U	Uranium	

Preparation of Powders

Metal powders of almost every known metal are now available to this comparatively young art. Most metal powders are produced by electrolysis, atomization or reduction of the metal salts by gases.

Tungsten metal powder, for instance, is manufactured by the reduction of tungsten trioxide by either carbon or hydrogen. Iron, chromium, nickel and copper metal powders are usually produced by the reduction of their oxides by gas (hydrogen or carbon monoxide) or by electrolysis. Low melting point metals, aluminum, zinc and lead are produced in powder form by atomization of the molten metal. The above methods seem to provide more satisfactory materials to the fabricators of metal powder compacts than other methods.

Powder preparation for size, purity and proportion in compounding of alloys or mixtures with non-metallic components has been worked out for a wide variety of powders by material suppliers. Size of powders as usually gaged by the standard screen mesh through which they will pass, is highly important to proper flowing, filling and elimination of voids in initial compacting. The method of preparation also governs whether particles are more or less equiaxed or relatively flat. The metal powders are successfully handled in much smaller average grain size than the synthetic resin mixtures, perhaps due to somewhat similar proportion in molecule sizes.

Avoidance of Arching

The tendency of powder particles to arch and lock leaving local voids ... Starting with a typical process and notes on powders in the first part of the article, the discussion takes up the making of porous products such as bushings and then solid compression problems, showing different types of presses which have been used and others which offer advantageous features worthy of consideration. In the concluding part, the authors discuss dies, heat treatment and presses as applied to a variety of powder products. The data was originally presented as a paper before the 1944 spring meeting of the Electrochemical Society, Inc.

and non-uniformities, has led to some preference in thin walled sections to compact both from the top and bottom, using hydraulic cylinders or mechanical movements above and below in the press. A similar effect may be obtained in properly timed hydraulic or faster mechanical double action presses, or by moving floating die walls down half the working travel of the compressing punch slide or ram, as in Fig. 5. More general and simpler practice, however, for metals and organic and ceramic mixtures is to compress from the top with suitable knockouts below. .

The shape of metal powder particles is determined, for the most part, by the method of manufacture. Aluminum powder made by granulation is quite different from that made by stamping. Copper powder made by reduction is decidedly different from that made by electrolysis, the shape of particles of metal powders produced by condensation, as in the case of zinc, or by the decomposition of their carbonyls, as in the case of iron or nickel, is spherical.

Where the powders are sufficiently coarse, the particle size and the particle size distribution may be deter-

FIG. 2—Difficult sintered metal powder parts. The extreme ductility of the finished products is clearly demonstrated by the distorted samples at the lower right.

Photo courtesy American Electro Metal Corp

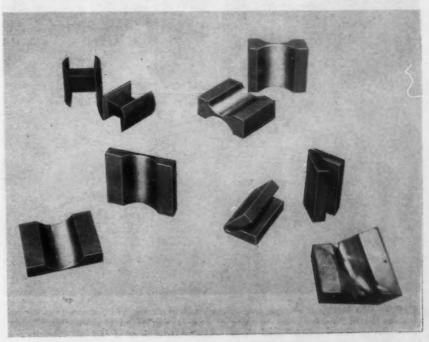




FIG. 3—A sintered bronze bracket for gun sight, straightened on a Bliss No. 211/2
Photo courtesy Amplex Division, Chrysler Corp.



FIG. 4—The knuckle joint type press offers the best timing and the most economical press construction for accurate sizing or cold forging of metal powder parts after sintering. This is a Bliss-Toledo No. 661 Knuckle Joint press of 150 tons capacity.

mined by the use of metal sieves; however, this method is not applicable for particles finer than 400 mesh. The diameter of a particle passing a 300 mesh sieve is about 53 microns or about 0.00206 in. (a micron = 0.001 mm. = 0.000039 in.).

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In the case of finer powders, microscopic examination may be employed or a measurement of the light blocking action of the powder in suspension in a liquid may be measured. This is especially true in the case of finished powders used in the hard carbide industry where the particle size may range from 1 to 5 microns, or finer. The powders may be pressed either hot or cold, but in the majority of cases the operation is carried out at room temperatures. The powder is pressed in dies made of hardened steel, selected to have as low a coefficient of friction as possible. In some cases, where small pieces are pressed from highly abrasive powders, the dies are made of hard carbide compositions produced in turn by powder-metal methods. Shrunk ring die construction is often used with prestressed wall members as in Fig. 6 to minimize deflections under load.

The depth of the die will depend to a certain extent upon the compression ratio of the powder which is usually in the neighborhood of 3 to 1. In some cases, however, where fine powders are used, the compression ratio may be as high as 6 to 1, or even 8 to 1, due perhaps to entrapped air.

Pressures required vary between 5 and 100 tons per sq. in. and are related to the yield point of the metals and density and flow shape of the part.

Strange as it may seem, slow compression is not as satisfactory as a quick stroke. A fast powerful stroke tends to greater uniformity of working. A brief dwell may be required to relieve the bursting compression of trapped air unless the powder hopper is vacuumized.

Price is of vital importance in the progress of powder metallurgy. The following is a tentative list of present prices of some of the metal powders, by Chas. Hardy, Inc., New York:

Aluminum. 25¢ to 32¢ per lb.
Aluminum Alloys 30¢ to 42¢ per lb.
Brass 21½¢ to 30¢ per lb.
Chromium \$1.25 to \$2 per lb.
Copper 21½¢ to 38½¢ per lb.
Iron 2½¢ to 80¢ per lb.
Iron 2½¢ to 80¢ per lb.
Lead 11½¢ to 50¢ per lb.
Manganese 65¢ to \$1.25 per lb.
Molybdenum 33.50 to \$9 per lb.
Nickel 62¢ to 85¢ per lb.
Platinum \$50 an ounce \$11ve to \$1.25 per lb.
Titanium \$9 to \$1.25 per lb.
Vanadium \$4.25 to \$4.50 per lb.
Vanadium \$4.25 to \$4.50 per lb.
Zine 15¢ to 50¢ per lb.

In cooperation with Dr. James Hillier of the R. C. A. Laboratories at Princeton, N. J., the Hardy Metallurgical Company recently has investigated metal powder particles and sintered parts made therefrom with the aid of electron microscope technique at magnifications ranging up to 20,000 diameters. The photomicrographs reveal that particle boundaries under proper sintering conditions are completely obliterated to produce a continuous metallic structure.

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Related Products

In considering the molding or compressing of meal powders it should be remembered that ceramics, cemented carbides, grinding abrasives and synthetic resins have much in common. The metals themselves are subject to advantageous alloying for many purposes as illustrated by Fig. 7. Most of these Alnico parts are briquetted in fast mechanical presses at about 30 tons per sq. in. and then sintered in pure dry hydrogen at a temperature close to the alloy melting point. The material is too brittle for subsequent sizing or coining operations and, accordingly, tolerances are relatively high, for example ±0.010 in. on a $\frac{1}{2}$ in. dimension up to $\pm 1/16$ on dimensions over 3 in. Dies, consisting of the usual die ring, punch, bottom, knockout plug and possibly a core pin, are of quality steels, possibly with carboloy inserts. These sintered magnets are 3 to 5 times stronger than cast alnico parts which are competitive in the larger sizes.

An interesting transition between molded ceramics and powder metallurgy is found in certain (Permalloy) telephone and radio cores. Here, for high magnetic permeability, granules of iron and nickel or molybdenum are prepared and coated with a thin film (0.00002 in. approx.) of ceramic clay as an insulator of eddy current losses. The coated granules are die pressed to shape under about 100 tons per sq. in. pressure to a density of about 7.75 g/cc. and annealed to restore magnetic quality, and incidentally, at a temperature which sets the ceramic as a binder.

Abrasive wheels are molded with pressure, temperature and time combinations to suit the particular mixture. The fillers in the mix are the hard, sharp crystal particles, as of silicon carbide or aluminum oxide in iron oxide, for grinding purposes, with such binders as rubber, the clays, phenol-formaldehyde or other thermosetting resins. Heated dies in hydraulic presses are used for the resins



FIG. 5—Pouring and spreading a charge of iron powder (profiled spreader) in a floating ring die in a Bliss 200 ton Hydro-Dynamic press with bottom knockout cylinder. Note that floating the die ring equalizes the compacting of the powder charge from top and bottom and offsets the restraint to flow or wall friction.

and rubber, or cold pressing followed by drying and baking, for the ceramic clays.

Cemented Carbides

For cutting edges, drawing, extrusion, heading and cold forging dies, spot-welding tips and other points of application of severe and abrasive stress, cemented carbides combine such hard filler materials as tungsten carbide, tantalum carbide and titanium carbide, with such binders as cobalt, nickel and copper. Suitable sized and shaped powders are cold

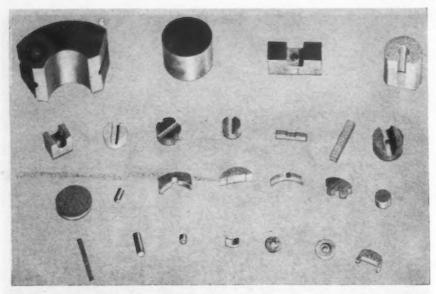
TABLE I

Copper And Iron Prepared From Powdered Metals

Stages in improvement of properties with experimental alternate compression and recrystallization

OOPPER	Density, Gram per c.c.	Brinell Hardness	Ultimate Tensile, Lb. per Sq. In.	Elongation In 2 in., Per Cent
Pressed, at 50 tons per sq. in. Sintered, at 1470 deg. F., 8 hr. Repressed, at 50 tons per sq. in. Resintered, at 1470 deg. F., 8 hr. Cold rolled, 25 per cent reduction. Reannealed, after 25 per cent reduction. Reannealed, after 50 per cent reduction. Cold rolled, 75 per cent reduction. Reannealed, after 50 per cent reduction. Reannealed, after 75 per cent reduction.	7.47 7.90 8.39 8.37 8.33 8.35 8.57 8.59 8.80	73 34 70 39 97 39 109 41 117	970 16,000 22,200 25,500 37,300 17,000 44,400 24,600 49,000 32,700	0 9.5 4.0 17.0 4.0 18.5 2.5 22.0 1.0 27.5
Pressed, at 50 tons per sq. in. Sintered at 1830 deg. F., 8 hr. Repressed, at 50 tons per sq. in. Resintered at 1830 deg. F., 8 hr. Cold rolled, 25 per cent reduction. Reannealed, after 25 per cent reduction. Cold rolled, 50 per cent reduction. Reannealed, after 50 per cent reduction. Cold rolled, 75 per cent reduction. Reannealed, after 50 per cent reduction. Reannealed, after 50 per cent reduction.	6.23 6.68 7.27 7.23 7.39 7.40 7.67 7.69 7.74	69 47 67 63 107 63.5 133 68.5 161 68.5	470 27,000 30,500 34,900 50,500 30,600 63,000 32,600 77,700 33,800	0 10.0 4.0 20.5 2.0 15.5 1.0 21.5 0 28.0

From "Plastic Deformation", C. G. Cootzel, American Electro Motal Corp. in "Powder Metallury", American Society for Metals, Cleveland, 1942



F IG. 7—The exceptional possibilities of control of alloys as well as of finished shapes by the use of pressed powders is illustrated by this group of powerful Alnico Magnets (aluminum, nickel, cobalt).

Photo courtesy General Electric Co.

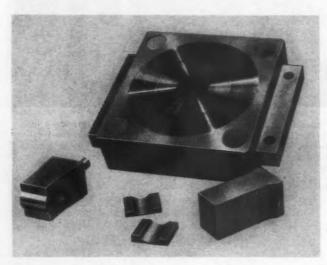


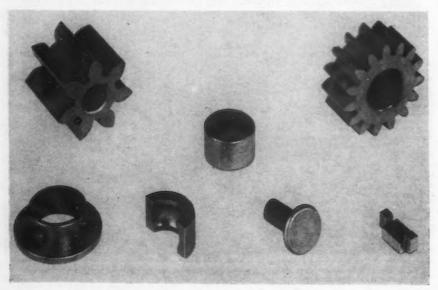
FIG. 6—Details of the die and the product, and iron powder pole piece. Note the shrunk ring construction of the die to pre-stress the wall members against expansion under load to minimize fin formation. Carefully lapped walls and punch surfaces are also vital.

Courtesv American Electro Metal Corp.

0 0 0

F 1G. 8—The remarkable lubrication advantages of porous metal parts dictate the design of some of these pressed iron powder parts sintered in a General Electric controlled-atmosphere mesh-belt electric furnace.

Courtesy Moraine Products Division of General Motors Corp.



compressed in steel dies and hydraulic presses and sintered or baked in a reducing atmosphere, well up in the recrystallization range of the binder, or hot pressed at similar temperatures in low pressure (1000 lb. per sq. in.) graphite molds, with time allowance for recrystallization of the binder.

The latter method would make for greater density, if die materials were available which would stand up properly to both the pressures and temperatures desired.

While comprehensive strengths of the cured mixtures reach 500,000 to nearly 900,000 lb. per sq. in., the much lower tensile strengths are derived from the 3 to 20 per cent of relatively low strength binder so that the carbides are often molded directly into steel holders or rings. Similarly, powdered copper and tungsten carbide tips molded directly on copper electrodes combine conductivity and wear.

The compression molding of metal powders follows much the same rules as govern the synthetic resins. Pressure welding of powders of thermoplastic materials, both metallic and organic, takes advantage of intermolecular attraction for bonding purposes. Distinction should be noted between such pressure welding of similar fragments and the bonding of powder mixtures in which some filler powders are bound together by other constituents introduced as adhesives or binders and in which the reaction may be considered to be thermosetting.

Essential Requirements

The four essentials of thermoplastic pressure welding are (1) intimate contact of (2) clean particles at (3) suitable temperatures within their thermoplastic range and for (4) sufficient time to permit adjacent atoms or molecules to improve their relative alinement and establish cohesive forces as a bond. Such pressure welding can occur almost instantly between particles of a steel shaft in a steel bearing or of a steel sheet in a steel draw die when the insulating film of lubricant breaks down.

Pressure above the yield point of the material assures intimate contact. Further improvement may be accomplished by mechanical working of the mass, forging granules into even more uniform compactness and filling cavities which molecular or atomic forces could not close. Oxidation of surfaces forms an effective barrier against nydrauaked in in the binder, mperalb. per n time of the

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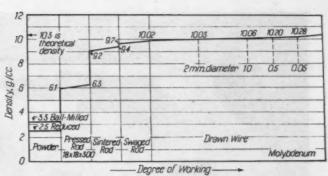
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forming molecular bonds and accordingly a protective atmosphere or enclosure is usually required during the welding or sintering period. Freedom of the powders from surface oxides and dissolved oxygen is highly important.

Where porosity is desired, see Fig. 8, the particles need only join at random points of contact. However, voids among the cohesive particles may be reduced by pressure or substantially eliminated by plastic working during or between applications of heat sufficient for recrystallization. The thermoplastic range begins at initial recrystallization temperatures and continues to the melting point. As lead and tin recrystallize below ambient temperatures, it is reported that their powders may be pressure welded without added heat at pressures down to 500 lb. per sq. in. FIG. 9 — Improvement in density of molybdenum powder; first as it is cold pressed at 60,000 lb. per sq. in., then sintered above its recrystallization temperature, then plastically worked by swaging and wire drawing with intermediate annealings to correct interatomic strains.



Courtesy C. G. Goetzel, American Electro Metal Corp. and American Society for Metals.

Tungsten is an outstanding commercial example of converting from powder to practically flawless, ductile wire though temperatures are necessarily extremely high.

Fig. 9 indicates the progressive steps in the conversion of molybdenum powder to drawn wire four times as dense. The density is plotted to show elimination of voids and gradual approach toward perfect atomic packing of the crystal space lattice. Along similar lines and more familiar to sheet metal workers are the comparisons in the accompanying table in which are shown experimental steps and changes of properties in conversion of copper and iron particles to ductile form.

(To be concluded)

Metal Spraying Costs Reduced

By FRED C. GANDERT

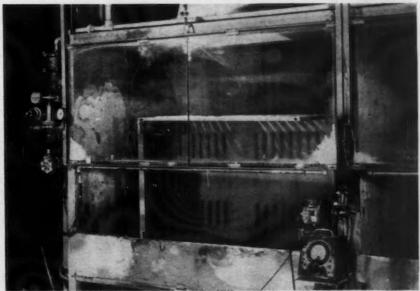
Welding Engineer, Westinghouse Electric & Mfg. Co. Mansfield, Ohio

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piping the oxygen to the metal spray booths, thereby eliminating any cylinder handling by the operators.

Lower fuel costs can be achieved, although a natural gas and oxygen flame does not have as high a flame temperature as oxy-acetylene, because a higher pressure can be used to offset this B.t.u. loss.

Using high pressure natural gas also provides a wide range of spraying speeds and makes possible a 15 per cent saving in operating time. The number of sq. ft. of metal that can be sprayed per hr. is governed by how many pounds of wire can be melted at the gun.



METAL spray booths are equipped with glass shields and air curtains to protect metal spray operators from fumes. Air curtain is a ½-in. pipe with a series of small holes drilled in the bottom. Compressed air passes through these small holes and prevents any fumes from reaching the operator. The glass shield can be raised to place the cabinets on a turntable for metal spraying and then lowered with the glass curtain to give the operators maximum protection from zinc or copper fumes.

cent reduction in fuel cost and higher spraying speeds.

This natural gas and oxygen process was employed when an increase in the production schedule of Navy plane radios required a corresponding increase in metal spraying facilities.

Although oxy-acetylene for the metal spraying of sheet metal has several

SING natural gas and oxygen

for the metal spraying of zinc

or copper on light sheet metal

at the Westinghouse plant in Mans-

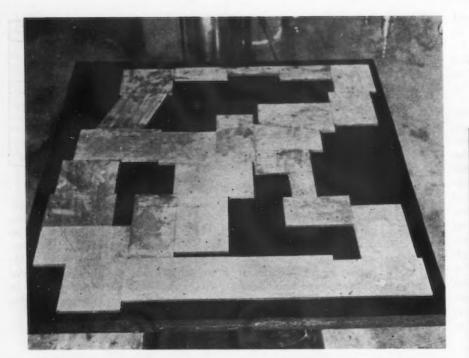
field, Ohio, has resulted in a 15 per

Although oxy-acetylene for the metal spraying of sheet metal has several advantages, it has one disadvantage on a large production setup. Underwriters specify that acetylene pressures must be held to a maximum of 15 lb. and this pressure limitation was a definite handicap in trying to increase the spraying capacity of the

guns.

After making a study of the various fuel gases that could be used in metal spraying of zinc and copper it was decided to install a booster pump in the plant's natural gas line and pipe the gas to the metal spray booths. The booster pump is capable of supplying the spray guns with pressure up to 150 lb. It has been found, however, that a 50-lb. pressure apparently is the most efficient and economical to use. Gas pressures higher than that do not increase the number of pounds of metal sprayed per hour in proportion to the additional amount of gas and oxygen consumed.

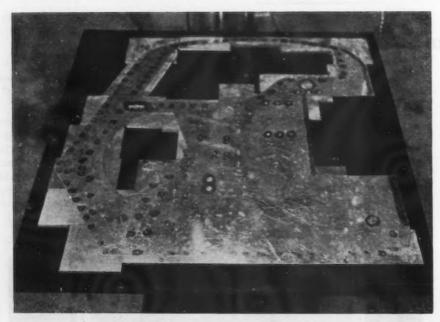
A further advantage was obtained by installing an oxygen manifold and



New A

ONSECUTIVE operations in the construction of a large Kirksite compound blank and pierce die at Southern Aircraft Corp., Garland, Tex., are illustrated in Figs. 1 to 5. Total perimeter is approximately 325 in. and a punch press tonnage of about 200 tons is required to blank the part from 0.040 in. 24ST aluminum alloy. The die carries 174 pierce punches.

In this die the punch is posi-tioned below the die, so that all slugs from the pierced holes



UPPER LEFT

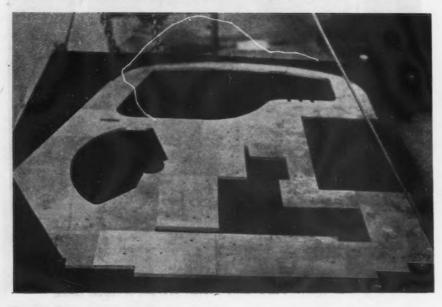
FIG. 1—Shown here is one stage in the construction of the sectional punch which is made of 1/2-in. tool steel and is mounted on a 11/2-in. cast iron punch plate. The pattern of sections was decided on through the use of a paper layout.

LEFT

FIG. 2—To save hand fitting, full advantage is taken of all straight sides. While the templet is lying in place, all holes in the templet are transferred to the punch sections and are later drilled and reamed to size.

LOWER LEFT

FIG. 3—Here is illustrated the punch after it has been cut to the contour of the templet.





42-THE IRON AGE; June 27, 1944

ew Aircraft Die Designs

drop through the punch plate to the die shoe. Clearance is provided for the removal of these slugs by spacing the punch plate from the die shoe with I in. square cold rolled steel bars bolted parallel across the back side of the punch plate. Compressed air is used for blowing the slugs from the clearance slots thus provided. To eject the blanked part and strip the scrap from the punch, rubber is used.

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size.

FIG. 6—Instead of constructing two separate forming and curling dies or a single two-stage die to turn out right-hand and left-hand parts, one die, shownhere, was designed and built. The part of the die that forms the right-angle bend and the gusset reinforcement is common to both left and right-hand parts. However, separate shoulders are provided over which the curled ends are rolled. In operation, the flat blank of 0.078-in. chrome moly steel is placed across the center pin with a "V" point. This pin serves as a pressure pad to hold the part in place during the forming operation and is actuated by the spring shown on the left. When this same pin bottoms, it also serves the additional function of forming the small gusset reinforcement into the "V" cut. Parts are formed one at a time.



BELOW

FIG. 4—The sectional Kirksite die made from %-in. rolled sheet stock is ready to be sheared to fit the completed punch.

FIG. 5—Pierce punches shimmed in their respective places are ready to be anchored with Cerromatrix in the die opening.

THE IRON AGE, June 29, 1944-43 .

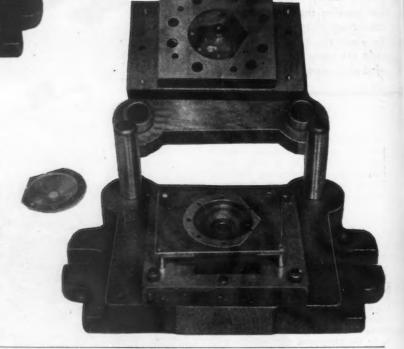


FIG. 7—In order to form, pierce and trim a part having a flared center hole in two successive operations, the dies shown here and in Fig. 8 were built. By spring loading this die and allowing it to lead the small piercing punch which is rigidly mounted to the punch holder in the center of the die block, the center hole can be pierced in the first forming operation. Flaring of the hole is accomplished during the final piercing and trimming operation. To eliminate wrinkles, a spring loaded pressure ring surrounds the punch. In operation, a square piece of 0.025-in. cold rolled steel is placed against the three pin locators. With the part securely clamped between the die and pressure pad, the forming operation takes place, on completion of which the center hole is pierced.

RIGHT

FIG. 8—The inverted type of die construction is also used for the piercing, trimming and flaring die shown here. This was done in order to allow the pierced slugs to fall through the bolster opening. Rubber actuated stripper and ejector are used. The ejector mounted in the die opening is stepped in such a way that the extending boss contacts the bottom of the formed center section of the part at the same time the flanges are contacted. This prevents any distortion of the part as the small flaring punch emerges from the center of the ejector and flares the center hole.





Electrodeposition of Copper Powder

N a report before the 85th general meeting of the Electrochemical Society held in Milwaukee April 13 to 15, W. H. Osborn and S. B. Tuwiner of the Phelps Dodge Corp., Laurel Hill, N. Y., described their attempts to produce copper powder in a standard electrolytic copper refinery.

At the start of the study, the investigators set out to retain the same current density, electrolyte composition and temperature which had been proved optimum for most economic refining practice. In addition the same impure refinery anodes were to be used, allowing slimes to collect at the bottoms of the tanks for intermittent removal. Electrolyte circulation was to be maintained at the rate customary in copper refineries. It was hoped that by a substitution for the oil used

in preparing the brittle cathode, a deposit of copper powder might be obtained.

The method finally preferred was the application of castor oil previously oxidized with a small amount of perchloric acid to a rolled sheet anode followed by the electro deposition of copper as a powder, using the same equipment and electrolyte employed in the multiple system of copper refin-

The investigation resulted in the discovery of a crystalline metallic deposit having the following characteristics: Ultimate particles are flakes, each being a single or twinned crystal. The flakes are arranged in the deposit to form a cellular structure with a high fraction of voids. Individual flakes are about 1 micron thick

with the other dimensions being about 30 to 50 microns. Each flake is coated with a film of oil which was applied to the cathode sheet.

It was obvious that the particles of copper grew in two dimensions only. For some reason, probably selective wetting by the oil, growth was impeded in the third dimension.

The powder produced by this method is not suitable for the usual sintered metal products because of its flow characteristics and because the copper particles are coated with an oily film. However, this type of electrolytic flake copper powder is ideally suited to further processing either by ball milling or by stamp milling, obtaining a very fine grade of bronze powder which is especially useful in anti-fouling compositions.

Have Huebner and Huffman Fix Something Up

N a veteran Seabee battalion in the South Pacific, "Have Huebner and Huffman fix something up" is the stock solution to any problem which calls for the transformation of an assortment of scrap into some useful and badly needed tool. The source of material is immaterial; several of their masterpieces were concocted on Guadalcanal of steel beams, engines, winches, and oddments of miscellaneous junk abandoned by the Nips. Give Chief Carpenter's Mate Marion T. Huebner, of Houston, Tex., and Chief Shipfitter Fred G. Huffman, of Bluffton, Ind., a supply of welding rod and salvaged steel and write your own ticket.

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When the Navy Department's Bureau of Yards and Docks established its construction battalions it provided them with a substantial well-rounded allowance of construction equipment and general purpose tools. Obviously, it was impossible for the bureau, or anyone in the Navy, to predict where any particular battalion would serve, or the conditions and tasks which it might encounter. Just as obviously, it was out of the question to supply each outgoing unit with the host of specialized tools which would be required to anticipate any possible contingency. To solve this problem, Admiral Moreell, Chief of Civil Engineers and the guiding spirit of the Seabees, had an answer: "Get the men with the know-how." And for two years Huebner and Huffman, like thousands of other "men with the know-how," have been devoting their Yankee ingenuity and technical skill to the development of gadgets vital to the Seabee's job of building the bridge to Tokyo.

Their first effort in this line involved a bridge of more modest dimensions, a 200-ft. trestle spanning the Lunga River on Guadalcanal. Huebner landed on Guadal with the first echelon of the battalion, three weeks behind the Marine invasion. Huffman followed by ten days. By that time Cmdr. Joseph P. Blundon, the West

By LT. CMDR. MARK H. JORDAN, CEC, USN

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Virginia consulting engineer who commanded the battalion, already had well in hand his primary taskthat of rushing the completion of Henderson Field. However, Major Vandegrift had tossed another problem into his lap-to span the swift-flowing Lunga with a bridge of sufficient capacity to take artillery, tanks, half tracks, tractors, and other loads for which the existing Jap structure was utterly inadequate. Japanese steel and timber and creosoted telephone poles were available for the job; but heavy construction equipment had been delayed by the critical shipping shortage, and the pile driver essential to the work was conspicuously absent.

At this juncture Commander Blundon called on Chief Shipfitter (now Lieutenant junior grade) Roy W. Douglas of Vallejo, Cal., a graduate engineer whose background included a year on the Wake Island construction job, which he had left on vacation only a month prior to Pearl Harbor. Douglas and Huffman, then a shipfitter, first class, put their heads together and came up with a design for a pile driver to be built entirely of captured material. Douglas furnished the general plan. Huffman, a skilled welding engineer, detailed the welded connections and supervised the fabrication, doing much of the welding himself. Steel trusses, intended to support Japanese hangar roofs at Henderson Field, formed the towering leads which guide the pile and hammer. Japanese steel beams went into the base and a Japanese winch and engine provided the power. For a hammer the builders constructed a box of steel plate, filled with concrete made of Japanese cement. The bridge went up.

Huebner, meanwhile, had been placed in charge of the blacksmith shop. A bridge builder in his native Texas, he was classified by the Navy as a wharfbuilder, but his uncanny skill at improvising soon led Commander Blundon to place him where his talents could have full room for expression. With spare parts for automotive equipment unobtainable, the constant wear on overworked trucks, tractors, and crawler cranes placed a tremendous load on the repair facilities and on the ingenuity of the men who operated them. Once Chief Machinist's Mate Glenn P. Helme, of Harrison, Neb., repaired Allis-Chalmers tractor with clutches adapted from a Japanese Kato. Chief Machinist's Mate William A. Farmer, of Andrews, Tex., pieced together parts from half a dozen junked Japanese trucks to produce two machines in working condition. In an atmosphere such as this Huebner thrived.

Lieut. Al Pratt, of Brigham City, Utah, brought one of his problems to the blacksmith shop. The steel pierced plank with which Henderson Field was being surfaced came in sheets 10 ft. by 15 in. As it was laid on the field in a brick-work pattern, every second end sheet overhung the adjacent sheets by 5 ft. Cutting with the oxy-acetylene torch, the obvious answer, was slow and, as Huebner well knew, both oxygen and acetylene were extremely scarce. Could not some other way be found of cutting sheets in two to eliminate these ragged edges and save precious steel?

The blacksmith shop labored and in due time brought forth a shear which, hand operated by six men, snipped off 10-gage steel plates like cardboard.

The masterpiece of the Guadalcanal campaign, however, was the "Southwest" crane. One of the most critical problems faced by the battalion was the handling of heavy objects in unloading boats and barges at the beachhead. The few crawler cranes available were sorely needed on construction work, and the process of changing their rigging and of moving them from a gravel pit to the beach, and



ABOVE

View of the 5-ton traveling bridge crane in use. Chief Carpenter's Mate Marion T. Huebner of Houston, Tex., who designed the crane, watches Frank T. Lubanovich, Machinist's Mate first class of Warrensville Hts., Ohio, guide a Diesel motor into position as Melvin W. Katt, Machinist's Mate first class, Menfro, Mo., lowers away.

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then back, meant at least two non-productive days for each move. "Aframe" derricks improvised on two small piers were slow, clumsy, and entirely inadequate, and when the authorities allocated precious shipping space to a stationary "whirly" crane, it was badly damaged in unloading. Experienced repairmen examined it and reported to Commander Blundon that an extensive list of spare parts would be needed to put it into operation. Marion Huebner thought differently. Ingenuity and hard work in the blacksmith shop got the machine

back in commission. Furthermore, the job had fired Huebner's imagination. Why wait for Noumea to ship cranes to the 'Canal when they might be built there?

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Junk material there was in abundance. The essential element, a wellbalanced rotating base, was found in the turn table of wrecked Jap radio equipment. Jap steel channels made up the skid base and the frame of the structure. The 35-ft. trussed boom was welded out of Jap pipe sections. Power was furnished by an engine salvaged from an "Alligator" amphibious tractor, the source also of the fuel tank. The original radiator was replaced with one removed from a Jap tractor. One Allis-Chalmers tractor furnished the winch and power-control unit, another the clutch for rotating the crane. Cable sheaves were acquired from other cranes, and sandbags were utilized as counterweights.

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BELOW

A 36-in, sheet metal roller designed by Chief Metalsmith George W. Adams of Benton Harbor, Mich., and built by Fred Cline, Metalsmith first class of Camden, Ind.; Gilbert R. Kottkamp, Shipfitter first class of Kinmundy, Ill.; and George F. Boemker, Machinist's Mate first class of St. Louis. The gears were salvaged from a wrecked hand winch and the frame fabricated from scrap stock. Sixteen gage metal can be rolled to a minimum 3-in. dia. by the roller.



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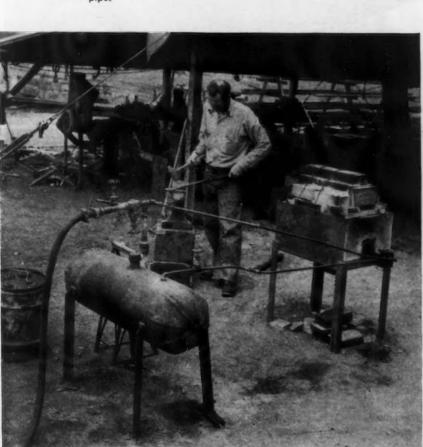
Put together under Huebner's skillful eye, these heterogeneous parts formed the 5-ton capacity Southwest Crane—so called in imitation of a well-known American make. Crude?—yes. Awkward-looking? — certainly. But it worked.

This creation provided a fitting climax to the labors of this pair on Guadalcanal. A few days after its completion, the battalion was relieved and transferred to a rear base for recuperation.

At their next duty station, a rear base in an advanced stage of development, the talents of these two and of the skilled men who worked with them in the metal shops had free rein. In work such as the construction of 1000-bed hospitals a heavy load fell upon the sheet metal shop, involving the fabrication of ventilation ducts and stacks, galley range hoods, smoke pipes, sinks, drain boards, steam tables and a myriad of similar fittings. Such work was the particular province of Chief Metalsmith George W. Adams



Oil fired forge designed and built by Seabee Fred Cline, Metalsmith first class, of Camden, Ind. Pressure fuel tank in foreground is made of 12-in. pipe.





ABOVE

Inside view of the vault door constructed by Seabee Chief Shipfitter Fred G. Huffman of Bluffton, Ind., and Chief Carpenter's mate Marion T. Huebner, of Houston, Tex. A combination lock was the sole pre-manufactured item in the door construction.

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of Benton Harbor, Mich., a veteran of 18 years Naval Reserve service and a skilled sheet metal worker. Adams soon recognized that to expedite such work a number of shop tools were essential, tools not on the regular equipment list for a Seabee battalion. A third member was added to the team, and again the junk pile furnished the solutions. With Adams furnishing the basic design, Huffman the welding details and supervision, and Huebner overlooking the construction, the sheet metal worker's basic shop tool, a break, was produced. It was 8 ft. 22 in. long, and was capable of bending 16-gage metal. Among the salvaged steel members used in its construction is a 12-in. I-beam obtained from an abandoned PT boat cradle.

This built, Adams' next design was for a roller, 36 in. in width, made of 3-in. shafting and gear salvaged from an old hand winch. Adjustable, it rolls cylinders and cones out of 16gage metal to diameters as small as 3 in. Then followed a burring machine, with several sets of interchangeable wheels, to be used for beading, flanging, or shearing in various steps of manufacture.

Meanwhile the blacksmith section of the metals shop was not idle. Much of the demand on this group came from Lieutenant Douglas' waterfront can heat up to 30 spikes in one batch. A shear, of which the essential elements are a jaw made of boiler plate and shear plates cut from an old blade of a road grader, cuts %-in. rods into suitable lengths, and also can handle flat bars up to % in. by 4 in. A mechanical hammer, adapted by Huffman from a salvaged riveting gun, does a rapid forging job on shaping points.

drill, which, using a gear box and chain and sproket drive off an abandoned motorcycle as a reduction gear, spins the bolt in the thread cutting die. The latter, held in a pair of horizontal guides, is free to move axially but not to rotate. Lubricating oil is fed from a pressure tank to a spout mounted on a moving guide which follows the thread cutting die in its axial travel. The used oil collects in a trough from which it can be returned by gravity to the tank.

Another pneumatic drill is the central element in a hand-operated drill press devised by the shop, which takes ½-in. to 1½-in. drills.



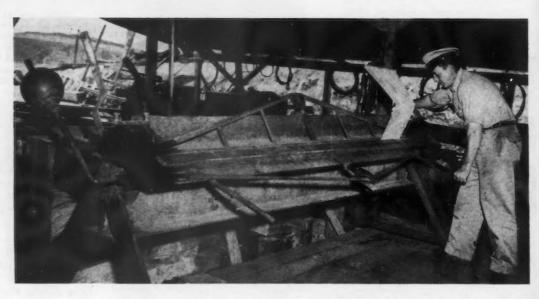
BELOW

Seabee Chief Metalsmith George W. Adams, of Benton Harbor, Mich., using an 8-ft. sheet metal break which he designed. It was constructed by Fred Cline, Camden, Ind.; David Deckert, Chicago; William R. Lewis, Jackson, Ohio; and Joseph F. Hoover, Youngstown. The welding was done by Frank J. Kunich, Granite City, Ill., and machine shop work by Harold A. Duvall, Petersburg, Mich., and George F. Boemker, St. Louis. The machine is indispensable for making bends and locks in fabricating sheet metalwork. Sheet metal up to and including 18-gage can be worked in the break.

ABOVE

The joint of pipe has been rolled and seamed and is now being put through the beading machine. This bead that is being impressed into the metal acts as a shoulder for the next joint of pipe and also stiffens the pipe.

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force, which in its work of building piers and waterfront bulkheads required spikes, bolts, and drift pins in large quantities. Metalsmith Fred Cline, of Camden, Ind., put this work on a mass production basis with two developments. His oil fired furnace utilizes diesel fuel for discarded motor oil, delivered to the home made burner by air pressure in the fuel tank (a section of 12-in. pipe), and atomized by additional high pressure air. It

One of the most wearisome tasks performed for the waterfront department was that of cutting by hand screw threads on bolts and tie-rods. Samuel G. Read, Metalsmith first class, of Niagara Falls, and J. E. Harrison, Machinist's Mate first class, of Gordon, Tex., members of a neighboring unit on loan to the shop, solved this headache with their proposal for a power threading machine. Motive power is furnished by a pneumatic

One of the most important rigs constructed by the shop is the Huebner-designed bridge crane. Lifting engines and other weights in the tractor shop was among Chief Machinist's Mate Helme's most ticklish problems. Even when a crawler crane could be spared from construction work for this task it lacked the fine control needed. In the absence of a crane a collapsible tripod made of 3-in. pipe was used to suspend a chain fall. Neither of these

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LEFT

R. A. Healy, Carpenter's Mate third class, is shown using an improvised drill press consisting of an air drill mounted on a stand constructed of salvaged pipe and scrap iron. The rig is used for heavy duty drilling and handles ½ to 1½-in. drills. It was designed by M. T. Huebner and constructed by F. L. Cline, J. F. Hoover, and F. J. Kunich.

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ter's Mate Fred Weinstock, of New York, a registered architect, was called in as consultant on the design, and George F. Boemker, Machinist's Mate first class, of St. Louis, did the fine machining required. With the assistance of these men and of the capable metalsmiths and welders in their shop, Huebner and Huffman produced a door, 4 ft. 6 in. by 6 ft. 6 in., made of steel plate and angles, fitting snugly into its frame. Eight steel bolts, moving in bushings machined from solid brass bar stock, are thrown by a handle, which works through a system of eccentrics and connecting rods. The combination lock which locks the operating handle is the only factory-made part of the entire job.

Of such works has the legend of the Seabees grown. If Huebner and Huff-



Seabee Metalsmith first class Fred Cline uses a homemade bar shear to cut length of flat bar stock. Chief Metalsmith George W. Adams holds the bar as Cline applies the shear. Cline designed the cutter using a frame of 12-in. channel iron and moving jaw of 3/4-in. boiler plate salvaged from a railroad junk yard. The gears were cut with an acetylene torch and the shear plates fabricated from an old grader blade. The cutter will shear a 3/6-in. round or 3/8 x 4-in. flat bar.

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arrangements was completely satisfactory. More to the taste of the shop men is the traveling bridge crane built under Huebner's supervision — as usual, from scrap and salvaged material. Spanning 20 ft. and having a run of 64 ft., it serves four repair stalls. Abandoned PT boat cradles furnished the main beam and axle shafting; railroad rails and wheels were obtained from the salvage yard of the Army's narrow gage railroad;

wheels on the bridge trolley are track rollers from an Allis-Chalmers tractor, and the rails are rods welded to the upper flange of the beam. A 5-ton differential chain hoist does the lifting. In addition to handling engines and other heavy parts, it can be used to pick up one end of a tractor or truck.

Probably the most unusual task posed to the shop was the construction of a door for a concrete vault at a large supply depot. Chief Carpenman were unique they would be remarkable. More remarkable is it that every battalion has its Huebner and Huffman. Under tarpaulin shacks in Bougainville and New Britain—in Quonset huts in the Aleutians—beneath the shadow of Roman ruins in Africa and Sicily—Seabee metalsmiths are at work today, fashioning out of scrap and Yankee genius the tools with which they will build the bridge to victory.

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Eliminating Maintenance Welding Fires

By H. P. QUADLAND

Safety Research Institute, New York

AINTENANCE welding fires can be a headache and occasionally they result in complete destruction of a plant. According to reports by the National Fire Protection Association, in the latter part of last year metal working plants at Cambridge, Mass., and Dowagiac, Mich., were severely damaged with respective losses of \$45,000 and \$174,000, while a railroad roundhouse at Bellefontaine, Ohio, suffered an \$800,000 loss when welding sparks ignited flammable materials.

The elimination of fire losses from portable cutting and welding operations has been accomplished at the Caterpillar Tractor Co., Peoria, Ill., by a set procedure for such work. Permits are issued by a fire inspector who has charge of the operations. Before the welding begins, the ininspector examines the job and surroundings and determines what precautions, if any, must be taken.

The permit looks like an ordinary, numbered sales slip, in duplicate, with space reserved for describing the work to be accomplished, the time it is started and completed, the inspector's recommendations, and, should fire occur, for remarks by the welding operator.

On the reverse side are the following instructions:

"It is required that foremen, operators, helpers, and others responsible for the work, follow all the precautions outlined below, as well as any extra precautions recommended by the fire inspector.

"1. Equipment to be used must be in good condition.

"2. Equipment must not be used in the presence of inflammable vapors and liquids, or tanks or other containers which have previously contained such materials.

"3. Floors and surroundings must be swept clean. Wet down wooden floors or protect with sheet metal, flameproof canvas or equivalent.

"4. Move combustible materials and supplies at least 40 ft. away. When this cannot be done, cover with metal guards, flameproof canvas, or equivalent.

"5. Remove inside deposits of ducts, collectors, etc., before beginning work.

"6. If necessary, extra men must be provided to watch sparks that may fall

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protects the plant during maintenance welding operations by covering nearby objects with flameproof canvas and by stationing a guard with fire extinguisher on the scene.

Photo courtesy Caterpillar Tractor Co.

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to floor below through cracks, doors or other openings.

"7. Provide close at hand sufficient hand or wheeled extinguishers, water pails, or hand hose to extinguish any fire that may start.

"8. After completion of work, inspect entire area. Keep a watcher on the scene at least 30 min. longer."

Should the fire inspector determine that the hazard is negligible, no one, other than the operator and his helper, is required on the job. If it is somewhat hazardous, however, then the inspector or a plant protection officer is assigned to the work with the necessary fire extinguishing equipment readily available to put out quickly any incipient blaze that may occur. The fire extinguishing equipment is inspected once a week and tested and recharged annually, so that it is al-

ways in top-notch condition.

Flameproof canvass is used to protect combustible materials in the vicinity and portable metal screens are arranged around the job for confining flying sparks. When the work is considered too hazardous even with such precautions, welding is not permitted and some other method is employed.

Since the use of cutting and welding permits was started at "Caterpillar" on Aug. 19, 1943, over 1000 were issued to March 10, 1944. During this time only one fire occurred. Nearby combustible material had been covered with flameproof canvas, but a spark bounced up underneath the edge of the canvas, where it ignited paper wrappings on stored material. This fire was immediately extinguished, without loss.

Why Not a 50:50 Cobalt-Copper Alloy

To prepare a workable alloy of equal parts of copper and cobalt has so far not met with success when resorting to ordinary fusion processes. Accordingly attempts were made to prepare such an alloy by two other methods, and the results of this investigation were reported by Colin G. Fink and J. Lawrence Hutton before the recent annual meeting of the Electrochemical Society.

The binary alloys of copper and

nickel are well known; many of them find extensive commercial application. Constantin, alpro, imperial metal, nico metal, locomotive tube metal, etc., etc. But the binary alloys of copper and cobalt are practically unknown. Why this difference in the affinity of nickel and cobalt towards copper? The physicist might suggest several explanations for this difference and yet chemically the two metals, cobalt and

(CONTINUED ON PAGE 112)

Metal Cutting Research and

Furnace Design Feature A.S.M.E. Papers

VER 70 technical papers covering all phases of mechanical engineering and many related branches featured one of the most ambitious semi-annual meeting programs ever conducted by the American Society of Mechanical Engineers. Subjects covered at Pittsburgh, June 19 to 22 included applied mechanics, cutting of metals, production engineering, attitudes toward methods improvement, lubrication, industrial furnace design, controlled atmospheres, heat transfer, material handling, industrial instrumentation, power, rubber and plastics. Space does not permit more than a sampling of a few of the papers of direct interest to the metal working industry. Among them are papers relating to investigations of new phases of high speed milling, machinability of metals. Even the panel discussion on developments in industrial furnaces in which 20 engineers participated covered so much ground that only a few of the newest angles can be reviewed here.

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Reporting on an investigation of radial rake angles in face milling steel with carbide cutters, J. B. Armitage, vice-president, and A. O. Schmidt, research engineer, Kearney & Trecker Corp., Milwaukee, indicated that the power requirement of a cutter with positive radial rake, initially, is less than for cutters with negative rake angles but that after the cutters have been run until wear shows on the cutting edge, the negative rake cutters will require less power than the former. Furthermore, the latter will stand up longer and show less wear.

A cutter with negative radial rake angle is more effective at higher cutter speeds because of its inherent additional strength at the cutting edge.

The authors showed graphs which indicated that the chip temperature and also the work temperature rises consistently with change in rake angle from 6 deg. positive to 30 deg. negative, at a given peripheral speed. Temperatures of both chips and work decreased with increases in the feed rate per min. The horsepower per

cubic inch of metal removed per min. was found to rise as the rake angle was varied from positive to increasingly negative, but there was a tendency for the values to decrease with increasing feed.

During this investigation, the power required by the tool and the temperature of the chips were measured with a calorimeter from which the heat developed in the chips was determined. The 1 in, round test bar and chuck was placed in a small sheet metal box containing 100 cc. of distilled water. A cover prevented chips from flying into space so that all fell into the water, the temperature of which was read on a thermometer. By calculation, the heat energy absorbed by the water was converted into mechanical work at the cutter spindle, which carried a twobladed 2-in. cutter. Work temperatures were measured at the surface with an Alnor low range thermocouple immediately before and after the cut.

Some interesting observations were made on wear of cutters. After four sets of cutters had removed 28 cu. in. of metal from SAE 1020 test bars, the following increases in power consumption were noted as the result of wear:

Radial	Rake	Power Incr
An	gle	Per Cent
6 deg	, pos.	34
0 deg	ζ.	24
6 deg	g. neg.	16
12 des	r, neg.	12

The wear on the 6 deg. positive cutter was particularly severe and for the first three cutters wear on the cutting edge was due to minute chipping of the carbide tips. On the 12 deg. negative tools only fine abrasion was visible.

Double Rake Angles

Other tests made at cutting speeds ranging from 100 to 800 ft. per min. proved to the authors that the tool forces are higher for cutters with negative radial rake angles than for positive rake angles. (See Fig. 2.) However, the fact that negative rake angles stand up so much better than

positive angles suggested the use of a primary negative rake angle in combination with a secondary positive rake angle, such as is illustrated in Fig. 1. Similar designs have been used on high speed steel single point tools, the authors pointed out. Various widths of land were tested and various secondary rake angles. With a land only 0.005 in. wide, a crater started to form behind the cutting edge after the cutter had removed a comparatively small amount of metal. Increasing this land to 0.015 to 0.020 in. gave a definite improvement in tool life, particularly with a 30 deg. secondary rake angle (15 deg. was also tried). Cutting forces were lower, see point on Fig. 2 for 12 deg. negative primary rake angle. For the 30 deg. secondary relief the force is roughly equivalent to the force on a cutter having an 18 deg. positive angle.

The results of these tests were so encouraging that an 8 in. diameter cutter with 12 blades was made up with the double rake angles shown in Fig. 1. Blades of solid carbide were ground and lapped so they could be held in ground slots in the cutter body. When operated at a speed of 465 ft. per min. and a feed of 30 in. per min. (chip thickness 0.011 in.), flat circular chips almost white in color were produced in machining a slab of SAE 1020 steel. The chips

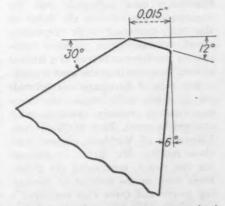


FIG. 1—Combination of a narrow land with 12 deg. negative rake angle with a 30 deg. secondary positive angle appreciable adds to the life of the cutter and provides much lower cutting force than a full negative angle cutter, according to tests reported by Armitage and Schmidt.

began to assume a bronze tint, indicating wear and increased force, only after 300 cu. in. of metal had been removed. In other tests it was found that the chief cause of chipping of the teeth was inadequate chip clearance, particularly at the highest feeds (60 in. per min.). The authors concluded that the main advantage of the double radial rake on a face milling cutter is that one cutter of basic design can be used for mild steel and non-ferrous metals by grinding a

chips, especially at the higher cutting speeds. On the other hand, at the lower speeds, too low a power will be indicated by the calorimetric method of measurement.

Practical Applications

Speaking on practical results of hyper milling of alloy steel aircraft forgings, J. Q. Holmes, master mechanic, Eastern Aircraft Division, General Motors Corp., indicated that 30 jobs are now being run in regular of one job where thin flanges are being faced. Here a soluble cutting oil is used to prevent the work from overheating. Machines are standard millers, but in no case are the motors overloaded. In the discussion, it was pointed out that the tooth loads were relatively light, a fact permitting hard grades of carbide to be used, besides accounting for the moderate power consumption.

At the conclusion of this session, Dr. Maurice Nelles, Office of Production Research and Development, WPB, indicated that his group was underwriting two research programs on high speed milling research, one at California Institute of Technology under the direction of R. O. Catland, the other at the University of Michigan, under the supervision of Prof. O. W. Boston. Caltech. has a 50-hp. miller at work on this project and is having a 100-hp. bed type miller constructed for this work. Dr. Nelles indicated that additional funds were available on other research projects on manufacturing methods and he said OPRD would welcome suggestions for such projects.

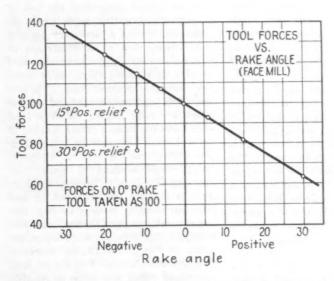
rake angles on face milling cutters. The two extra points for 12 deg. negative rake are for cutter tips having secondary positive rake angles of 15 and 30 deg., respectively (see Fig. 1).

against

FIG. 2—Tool force

plotted

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negative primary radial rake on the cutting edge in the case of steels or a positive primary rake in the case of non-ferrous metals.

Other conclusions made by the authors were that the average temperature of the chips produced by ordinary feed does not approach the melting point of the steel even at high speeds.

In some respects the data presented by Armitage and Schmidt were at variance with test data developed at the Cincinnati Milling Machine Co. and presented before the annual meeting of the society last December by Hans Ernst, research director. The Cincinnati data indicated that for negative angle cutters, the force on the tool decreased with increasing speed, whereas with positive angle cutters the reverse is true to a limited extent. Interpreting the heat energypower data of Armitage and Schmidt for a given rake angle, the force appeared to remain constant with changes in speed. Prof. O. W. Boston, University of Michigan, agreed with these results. Mr. Ernst, in discussing the paper, contrasted the differences used in the method of measuring power and force (his employed a special two directional force dynamometer) and pointed out that the calorimetric method did not take into account heat losses in the cutter and work. He admitted, however, that the greatest bulk of heat goes into the

production at the Linden, N. J., plant with negative angle carbide cutters. These include milling, turret lathe operations and precision boring. Milling rates range from about 5 to nearly 15 times those previously attained with conventional cutters in machining SAE 4140 chrome molybdenum steel forgings, some annealed and some heat treated to 40-41 Rockwell C. Many more forgings are machined per grind and the surface finish is definitely superior. Milling cutters now in use are of 6 and 8 in. diameter of 10 and 14 blades respectively. Eastern Aircraft has standardized on cutters with a 7 deg. negative axial rake angle and 10 deg. negative radial rake angle, using blades tipped with Firthite T-16 or equivalent hardest steel cutting grade. Peripheral speeds range from 800 to 1285 ft. per min. Table feeds were raised from 1 to 3 in. per min. for high speed steel cutters to 15 to 21 in. per min. with negative angle carbides. Chips range in thickness from 0.002 to 0.003 in. and come off at blue to red heat.

Experimentally, these same negative angle milling cutters have been applied successfully to machining aluminum alloys. Using a feed of 60 in per min. and a speed of 1712 ft. per min., chatter is eliminated and excellent finish obtained.

All hyper milling at Eastern Aircraft is done dry with the exception

Machinability of Steels

An index of machinability of plain carbon, alloy and austenitic (nonmagnetic) steels of the same tensile strength, based on the ratio of the yield stress to the ultimate strength, was proposed by E. J. Janitzky, consulting metallurgical engineer, Carnegie-Illinois Steel Corp., South Works, Chicago. He considered unsatisfactory the present tendency to judge machinability by any one factor of tensile strength, yield stress, Brinell hardness number or reduction of area. Two steels with equal tensile strength or equal yield stress may have different machining properties, depending on the ratio of yield stress to the tensile strength. Likewise two equal Brinell hardness numbers do not necessarily signify equal machinability. An austenitic steel may possess the same hardness as a quenched and tempered or annealed plain carbon steel, for example, and have different tensile properties and therefore different machinability properties.

Mr. Janitzky's approach to the problem of machinability of steel is to plot the yield stress ratios of different steels of the same tensile strength against the V_{∞} Taylor speed (cutting speed for a tool life of 60 min. with 18-4-1 high speed steel, using test procedures developed by Frederick W. Taylor). When this is done a curve with a reversing cycle is obtained, having its peak at a yield stress ratio of 0.5 plotted on the

abscissa. The author identified the cycle as a reversing parabolic cycle with the ascending branch in the form of a cubic parabola having its vertex at 0 vield stress ratio and the descending branch (an ordinary parabola) having its vertex at the maximum V. corresponding to a yield stress ratio of 0.5. He illustrated a whole family of reversing cycle curves, corresponding to different tensile strengths. Taylor speeds observed on test correspond closely to computed Voo speeds based on formulas developed by the author. He concluded that if two steels of whatever chemical compo-

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sition could be heat treated to the same tensile properties (tensile strength, yield point, elongation and reduction in area), they will be equal as to machinability. Leaded, sulphurized or phosphorized steels are exceptions.

Coordination of cold worked steels of the same tensile strength but different yield stress ratios may also be accomplished, according to Janitzky. When using the same tool, feed and depth of cut for steels cold worked to the same tensile strength, machinability will be found to increase with increasing yield stress ratio.

Trends in Furnace Design

A panel discussion on recent basic changes in the technology of kiln and furnace design and several allied papers on controlled atmospheres for furnaces brought out a number of points of interest to the metal working industry.

Combination of three or four process steps into one completely automatic straight - through production unit is exemplified in a new type of furnace described by H. M. Webber, General Electric Co. In a large roller hearth electric furnace, combat tank tread parts are copper brazed automatically at 2025 deg. F., partially cooled at 1100 deg., reheated to 1550 deg. and then quenched in oil, all in controlled atmosphere. Operating economy is achieved by elimination of handling of the work between brazing and heat treating operations and because the brazed parts and light weight trays are only partially cooled after the brazing, thus retaining about half the heat required for subsequent Excellent continuity of service and low maintenance are also substantial items.

Controlled Atmospheres

During the past several years there has been a rapidly expanding use of separately-prepared controlled furnace atmospheres as applied to industrial heating furnaces and metallurgical processes. According to C. E. Peck, Westinghouse industrial heating engineer, one widely used atmosphere is produced by complete reaction of an air-fuel-gas mixture, resulting in a gas very low in CO2 and water vapor content (decarburizing constituents). This atmosphere is now widely used for bright hardening alloy steels, tool steels and carbon steels without oxidation or decarburization. It is particularly applicable to the hardening of a wide variety of machine parts, many of which can be heat treated in the final machined form. This same completely reacted fuel gas atmosphere is quite useful as a carrier gas for gas carburizing, through the addition to the atmosphere of only a few per cent of additional hydrocarbon gas.

Another important controlled atmosphere, containing a high percentage of inert dry nitrogen, is produced from the combustion of a mixture of fuel gas and air with subsequent thorough removal of the two decarburizing constituents mentioned. Relatively inert and non-decarburizing, this atmosphere has been successfully applied to the long-cycle annealing of a wide variety of alloy steels, both in bar and coil form. It is used in the annealing of molybdenum tool steels and other types of high speed steel where it is necessary to prevent scaling and decarburization.

Although the use of prepared atmospheres is not economical in billet heating furnaces, by improved control of the constitution of the products of combustion, it has been possible to cut in half the depth of decarburization and the amount of scaling produced where no effort is made to regulate the atmosphere, according to Matthew H. Mawhinney, Salem, Ohio. For a reduction beyond 50 per cent of the maximum damage, attention must be paid to a reduction in the time of exposure at temperatures over 1500 deg. F. Although various methods of zoning furnaces have been tried, the results obtained have not been good enough, Mr. Mawhinney said. One recent innovation, however which has produced very encouraging results, is the use of two separate furnaces-one for thorough preheating at about 1500 deg., the other for final heating to rolling temperature at the fastest possible rate and with the fewest possible billets exposed.

Four new processes involving the application of special furnace atmo-

spheres to steel surfaces were described by Carroll Cone, Surface Combustion Co.:

- 1. Bright gas quenching has recently been applied to improve the physical properties secured in heat treating alloy steel aircraft tubing. Material is heated in a continuous roller hearth furnace, with the work surface protected by a non-oxidizing atmosphere. Work leaving the discharge end of the furnace is rapidly cooled through the critical range by high velocity jets of the same atmosphere, recirculated through cooling coils.
- 2. Skin recovery is a name applied to the process of recarburizing, in a furnace atmosphere, the decarburized outer skin of a hot formed steel part. Restoring the full normal carbon content of the outer surface in connection with the final heat treatment drastically improves the service life of parts subject to fatigue failure.
- 3. Clean forging has been made possible by the development of special atmospheres which are neither oxidizing nor effectively decarburizing at forging temperatures. Furnaces involve some radical changes in design from previous construction.
- 4. Gas pickling is now used to prepare cold reduced steel strip for superior results in continuous galvanizing, with complete elimination of "blisters." The process involves the use of a furnace atmosphere containing anhydrous hydrogen chloride to which work is continuously exposed at a red heat. (See "Gas Pickling of Steel," by J. J. Turin, THE IRON AGE, April 20, 1944, p. 64).

Carbo-Nitriding

Carbo-nitriding, a case hardening process in which both carbon and nitrogen are imparted to ferrous parts by a gaseous atmosphere, was described by J. A. Dow, metallurgist, Holcroft & Co. For duplicating the usual cyanide case, general practice is to add a very small amount of ammonia gas to an atmosphere suitable for light case carburizing at hardening temperatures. A higher carbon content is usually obtained by this procedure than from a cyanide bath and for this reason straight carbon steels may be oil quenched to full file hardness.

A further increase in ammonia gives straight carbon or low alloy steel parts with air hardening properties in the case, an advantage on parts which distort on quenching. Case depths up to 0.015 in. can be produced economically without any objectionable case brittleness.

New Equipment...

Material Handling

. . . Some of the more recent developments in industrial trucks, carriers, cranes and other conveying equipment are described and illustrated in the following pages.

AN improved 1-ton capacity truck designed for moving skidded loads of 1-ton or under has been announced by Yard-Man, Inc., Jackson 49, Mich. The "Truck-Man" incorporates a patented two-speed drive, a large ball thrust bearing which is said to reduce steering effort and an improved operator's seat with a form-fitting back developed in collaboration with the Safety Council of the



Ford Motor Co. to provide support when the operator is standing as well as seated and serve as a protective shield. Other features include an enclosed fly-ball type governor which replaces the old pneumatic type, heavier load wheels with a 4 in. tread, a gas tank of 1 gal. capacity, and V-type belt brakes which automatically set.

Truck Crane

A HEAVY duty P&H truck crane is announced by Harnischfeger Corp., Milwaukee. Its main feature

is a carrier built for crane work, not for crane transportation alone. Lower center of gravity is designed to give greater stability in terms of hoisting capacity and boom reach, without the use of outriggers. With outriggers, working range is proportionately increased. The problem of sway at the boom point is lessened by a frame

of all-welded box section construction with a built-in torsional bar. Operation is entirely independent of carrier power with either gasoline or diesel motor. Tractive power is by double drive axles in tandem and transmission has ten speeds forward and two reverse.



POR short distance transportation purposes as well as stacking and tiering, Willamette Hyster Co., Portland 8, Ore., is manufacturing the Hyster "75", a lift truck with a speed up to 12 miles per hr. and a capacity up to 7500 lb. The truck, which turns on its own length of 117 in. and has an overall width of only 60 in., operates on three large pneumatic tires and uses conventional automobile controls. It is claimed that a "75" can go anywhere an automobile truck can and will climb comparable inclines. On standard models the height of lift



is 108 in. from the ground to the underside of the load, but this distance can be altered on special orders.

Mobile Crane-Loader

THE compact loader shown, mounted on driven front wheels and rear caster, is capable of lifting up to 5 tons with its telescopic 12-18 ft. boom, toting load at speeds up to 12 miles per hr. and swinging full



load 90 deg. to either side without need for outriggers, according to the Jaeger Machine Co., Columbus, Ohio, uilders of the unit. Maximum drawbar pull of 6500 lb. is available for pulling or pushing loaded trailers or spotting cars. Four transmission speeds are provided.

Side Dump Trailer Truck

FOR use in collecting and hauling metal shavings, borings, light scrap and similar loads, a side dump trailer truck has been built by



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Palmer-Shile Co., 784 South Harrington Avenue, Detroit 17. Pivot design allows dumping to either right or left side; locking pin holds body in upright position for loading and unloading.

The company has also designed a combination truck and drain rack for handling oil drums. When the truck is tilted against a drum, steel fingers slide down to engage top rim of drum. Loading is automatic when truck is rocked back to wheeling position.

Truck Lift

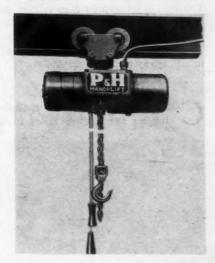
TRUCK lift mounted on a Case "DI" industrial tractor is being manufactured by the Frank G. - plant, a magnetic pulley type sepa-

Hough Co., Libertyville, Ill. The truck-lift, with a lifting platform 26 x 46 in., may be used for handling bulk materials in tote boxes, forgings, castings, heavy wheels, etc. It is claimed it will raise a weight of a ton or more from 51/2 in. off floor level to a maximum height of 6 ft. 10 in. in 10 sec.

Electric Chain Hoist

A^N electric chain hoist rated at 500 lb. has been developed by Harnischfeger Corp., Milwaukee. The Handi-Lift can be interchanged to bolt, hook or trolley mounting by loosening only one bolt. It can be suspended either parallel or crosswise to the beam for greater flexibility. Operation is by a pull cord actuating a lever toggle arrangement. A zinc die

cast safety limit stop also actuates control for raising and lowering loads. Lowering control is by dynamic means supplemented by a spring-set brake which holds the load should current fail. The motor operates on 3 phase, 60 cycle power at 220 or 440 volts.



Pulley Separator

FOR removing iron from run of mine coal in a preparation

> rator incorporating an air-cooled magnetic pulley 36 in. in diameter by 63 in. face width has been announced by the Dings Magnetic Separator Co., Milwaukee. The unit is considered to have the largest magnetic pulley ever incorporated into a pulley-type separator. The entire machine weighs over 17,000 lb., is powered by a 10 hp. totally enclosed motor and has a capacity of 450 tons

per hr. Features include rubber-covered idlers to increase the life of the belts and explosion-proof equipment. The magnetic pulley takes approximately 51/2 kw. d.c. for energization.

which is said to result not only in a strong coil winding but also in a more efficient one. They may be used in pairs, being suspended from a spreader-bar and operated in parallel from one controller.



Steel Grab

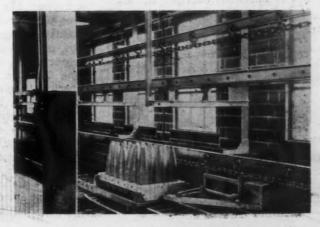
N easy method of handling steel Aplate or structural forms in various shapes and sizes with edge thickness up to % in. is provided by the steel grab developed by Mine Safety Appliances Co., Braddock and Meade Streets, Pittsburgh. When it is hooked and pressure applied, two powerful, many-toothed jaws with a 4 in. bite close securely on the sheet and hold it tightly until the lift or pull is completed. The grab has a rated capacity of 3 tons.

Chain Conveyor

O handle loaded skids along a roller bed, the Alvey-Ferguson Co., 718 Disney Street, Oakley Sta-

Lifting Magnet

LINE of magnets for handling billets and rails has been developed by the Electric Controller & Mfg. Co., 2700 East 79th Street, Cleveland 4. In place of rectangular-shaped coils usually found in magnets of this type, circular coils are used in Type BR,

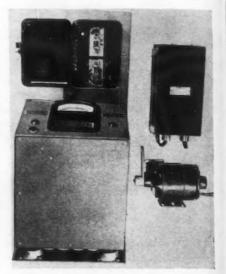


tion, Cincinnati 9, has designed a chain pusher conveyor which is mounted on trolleys riding on an I-beam track and pulled along by a chain. The chain and track are placed to one side of the roller bed, preventing any interference with the load. The load is carried on a skid platform provided with a wood runner underneath which rides on the rollers and serves as a guide on the inside of the roller frame. The load can be discharged on to a side line at any desired point by opening the gate or switch section in the roller bed.

are spaced 10 in. apart on chains traveling at speeds up to 160 ft. per min., under working temperatures ranging as high as 500 deg. F. As the link pins pass the lubricator, they are automatically given a shot of oil. The unit is tripped by lugs located on the chain sprocket wheel. It operates under minimum air pressure of 40 lb. Three-way adjustment makes it easy to aim spray nozzles accurately.

Conveyor Belts

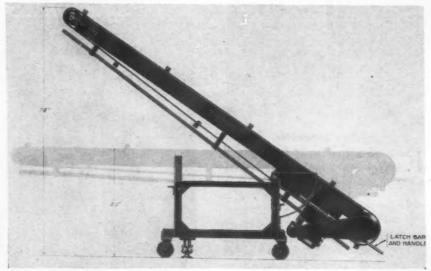
CONVEYOR operations extending as far as 6½ miles in a



a.c. bridge, changes in which which cause a deflection to register on an instrument. The complete gage consists of a strain gage and an accompanying balancing unit, an indicating unit, a constant-voltage transformer and a boom angle compensator. The constant voltage transformer is used in the gage power circuit to prevent interference by voltage variations. The boom angle compensator consists of a small, rotary voltage regulator.

Vibratory Conveyors

LINE of long vibratory conveyor equipment in various styles and capacities has been developed by the Syntron Co., 694 Lexington Avenue, Homer City, Pa. The conveying action is accomplished by high speed vibration set up by multiple, pulsating driving magnets. Control of the rate of flow of material is by rheostat from either close by or from a remote point. This can also be arranged for automatic control. Trough styles can be supplied in either flat pan or in sealed, tubular sections with or without multiple intake openings or multiple discharge gates at various points.

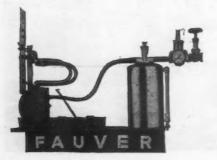


Utility Conveyor

A PORTABLE and reversing utility conveyor with an adjustable belt, Model CM-1, has been announced by Lamson Corp., Syracuse, 1, N. Y. The conveyor which can be used as an inclined as well as a horizontal unit is 11 ft. long, has a belt 14 in. wide and carries a maximum load of 100 lb. or 600 lb. per min. A self-locking drive prevents the load from running back when the 1/3-hp. motor is stopped.

Conveyor Lubricator

A N automatic conveyor lubricator designed for use on steel mill transfer tables has been perfected by J. N. Fauver Co., Inc., 51 West Hancock Avenue, Detroit 1. The link pins



single belt will be possible with steel cable reinforced "compass" conveyor belts, according to the Goodyear Tire & Rubber Co., Akron. The cables are laid in parallel, side by side, for the full length of the belt, in a single plane. They are brass-plated prior to being covered with rubber. It is said it is possible to operate a fully loaded 42 in. wide belt a distance of 6½ miles, handling 1000 tons per hr.

Crane Stability Gage

CRANE stability gage for use on boom type cranes and similar equipment has been announced by General Electric Co. The gage is especially designed to safeguard this type of equipment by continuously measuring its stability against handling loads in excess of the rated capacity at a given radius and against extending the boom to an excessive radius for a given load. In principle, the new gage measures the tipping moment or the degree of crane stability by determining the amount of deformation in the structural member of the crane upon which a strain gage is mounted. This gage and its balancing unit form two legs of an





The day New York folded up!

It was not good at all. The whole city just folded up like a stack of potatoes. No reason. Just collapsed. It was bad.

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"This is bad," said a usually well-informed source standing amid the ruins. "In fact, there's only one thing good about it."

"What's good about it?" said a voice from under a mass of office equipment and misses' wearing apparel.

"It demonstrates a very important fact," he mused. And then he explained it all this way:

If the entire city of New York should suddenly collapse that would represent the loss of about 21 billion dollars' worth of property . . . Now it took America's machine tools a powerful long time to produce a lot of that stuff—yet the entire contents

of the city of New York adds up to less buildings, equipment products and gadgets than will be sold in the year 1946 alone!* And 21 billion dollars represents a lot of buying—yet it is scarcely one-third the buying power that has been stored away already in the purchase of U. S. War Bonds!

Do we make the point? Machine tools are going to be very very busy after this war. We know, because Jones & Lamson engineers are already very very busy—working behind closed doors with the designers and planners of America's leading manufacturing companies, helping to develop now better products and cheaper ways to build them in the era of fast competition to come. They are at your service, too.

*Based upon a Department of Commerce estimate, assuming that the war and immediate conversion period will be over by 1946.

JONES & LAMSON

MACHINE COMPANY Springfield, Vermont, U.S.A.



Profit-producing Machine Tools

Manufacturers of: Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers.

Assembly Line

• Detroiters discuss
"Junior Priorities" as a
method for handling reconversion ordering on
a methodical basis . . .
Perennial rumors of
mergers follow Sorensen appointment at
Willys.



DETROIT—A new method of orderly, controlled reconversion is being discussed in Detroit by automobile company officials and government people from WPB. This system, called "Junior Priorities" at the present time, is very definitely only in the conversation stage, but enough interest is being elicited in it so that it may be developed more concretely in the weeks ahead.

The program would be based on studies now being made in this area and in other parts of the country by the Office of Civilian Requirements (see The Iron Age, June 22, 1944, page 106) as to what constitutes the most necessary civilian goods and services at this time. These would be set up on a controlled priority basis, just as was the output of war goods.

Companies would make applications for machines and materials to fill their production requirements. They would be given priorities similar to the war priorities now being issued, probably printed on another color of paper or somewhat similarly varied to differ from the war priorities. Companies would then file these priorities with their suppliers, along with the ratings on them.

On V-Day, then, a simple series of telegrams from the producers would authorize their suppliers to get into action on the priorities held in their files.

There are several obvious advantages to a system of this kind. In the first place, the suppliers and the subcontractors would have a good

idea of how much business they would be expected to handle in the immediate reconversion period, and they could make their plans accordingly.

STANLEY H. BRAMS

Under the recent order of WPB Chairman Nelson making it possible to order machine tools for civilian goods, the producers and suppliers could go into the market to purchase equipment to fill the junior priority orders on their books.

There is some talk of government aid to finance this equipment ordering and to cover costs of warehousing it during the period between production and use.

Automobile manufacturers appear to favor the plan, even though their products might be a way down the essential list. Indications today are that certain items of clothing, alarm clock and washing machines are the most-in-demand civilian goods. On civilian services, incidentally, medical and dental attention appear to be more in need than dry cleaning and others of the more discussed wants,

The industry is chafing, meanwhile, at delay in translating into action the Washington press releases on WPB relaxations on civilian goods output, and the indicated red tape in the anticipated orders themselves.

Several companies have placed orders with machine tool companies in past months, as reported here earlier, but these were sent in simply to make a place for themselves on the "future books" of the equipment suppliers. They will be translated into firm orders as soon as possible.

"As soon as possible," however, may be a little longer in the future than indicated. First, the buyers will have to establish that they have not been able to find and not been able to buy the goods they wanted from military procurement and DPC surpluses. Then the orders must be validated by WPB. These two strings somewhat irk the auto companies; they want a free hand in ordering.

Too, informal word from Detroit WPB offices indicate a bit of difficulty in getting delivery on such orders. First, manpower must be relieved of any possibility of eligibility for movement to other areas where help requirements are critical.

As for orders permitting experimental work, the auto companies are naturally glad to see Washington move in such a direction. However, so far as the car makers are concerned, it is not so much materials

that have blocked such preliminary work, but manpower shortage. This is not expected to clear up in the near term.

In the absence of instructions from Washington to the regional WPB boards, feeling in Detroit is that the capital will make the rules as it goes along. In other words, a company will go through the formalities of asking for experimental materials or tools. The district office will have no authority to follow out the rules reported from Washington but not yet formalized, and will pass the requests along to the top WPB offices for handling. The subsequent action will then set precedents. Procedure of that kind is not unusual.

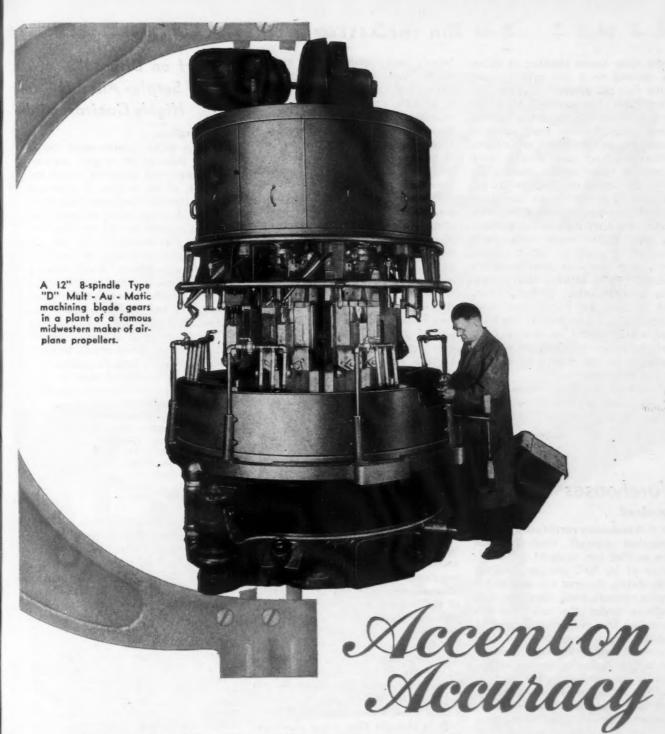
Meanwhile, the automobile companies are ready to move rapidly at the drop of the reconversion hat. First, of course, they stand prepared to cancel out their war commitments. One large company has painstakingly gone over its purchasing arrangements and has the stage completely set to wire blanket cancellations to supplier groups as rapidly as specific contracts are killed by Washington.

This company, and many others, are putting themselves into good cancellation positions by lightening their inventories to the lowest possible point. Sixty days' stock is allowable under CMP regulations, but in many cases the actual material and components on hand have been cut down to a 45-day level, so there will be no question of being on firm ground.

In this connection it is interesting to note that the most recent tabulation of the Detroit Purchasing Agents Association, as of the end of May, shows no forward buying beyond six Some small proportion of months. nine-month buying had been evident since the start of 1943, and before that purchases for a year ahead were not too unusual. Now, however, about a third of current purchasing is on a two-month basis, and half is for three months. Five per cent of the reporting firms continues to buy hand-to-mouth.

ELECTION of Charles E. Sorensen to presidency of Willys-Overland Motors, Inc., stimulated a new crop of automotive merger rumors.

Just as prevalent as the annual appearance of the dandelions, stories start up each spring in Detroit that the independent manufacturers will



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ries hat will When you think of the many Mult-Au-Matics now busy in the war plants of the nation, you probably think first of the increased output they effect, by drastically lowering machining time per part.

True, the Mult-Au-Matic method, machining six or eight parts simultaneously, does result in vastly greater output. But it is well to remember too, that Mult-Au-Matics turn out work that stands up to aviation's rigid standards of accuracy—or you would not find them in these plants, no matter how superior their increased output.

Consider MULT-AU-MATIC maintained Accuracy on all work, even in the face of inexperienced operators due to the present manpower shortage.

THE BULLARD COMPANY

BRIDGEPORT 2 CONNECTICUT

band their forces together in efforts to compete on a size equality basis with General Motors, Chrysler and Ford. And, just as inevitably as the turning of the leaves in the autumn, these stories followed their period of greenness by shriveling to nothing. Willys-Overland was usually mentioned in these reports, mainly because the Toledo company had an automobile in a lower price class than any of the other independents. This alone gave some logic to the possibility that Willys would merge with some other concern. At the same time, there was less point in anticipating mergers between such companies as Studebaker, Hudson, Nash, and Packard, for all of them were competing in approximately the identical markets, and no one of them could contribute anything not already possessed in one degree or another by any of the others.

As for Willys, that company did have a small car, but it was not a volume selling vehicle. The company's cash position was thin, so there were no advantages that Willys could offer in that direction.

With the acquisition of Sorensen as president, however, Willys-Overland moves into a somewhat different position. In the event that mergers were to be discussed with automotive companies. Willys could, so to speak, have Sorensen as its blue chip to ante into the pot, and a valuable blue chip he would be. This is a rather obvious observation and has been made by a number of people in Detroit; as a result, the merger rumor mills are going at full blast today, accompanied by the whispered word that "this time" the story may at last be true. Backing up the story is the lone fact that bankers have recently discussed merger possibilities with some of the auto companies. But commercial bankers exist to produce corporate changes. It would be surprising only if they neglected to sound out the automotive situation at regular inter-

Warehouses Now Surplus Steel Agents

Cleveland

· · Warehouses participating in the earmarked aircraft steel program were notified last week of the availability of an RFC contract making them Metals Reserve Co. agents for surplus aircraft steel, aluminum, and hardware under the new Aircraft Scheduling Unit redistribution plan by Walter Doxey, president of the American Steel Warehouse Association and resigning chairman of the Aircraft Steel Redistribution Committee. The entire committee is understood to be resigning since the redistribution plan has not only been drawn but is now being implemented. This committee liaisoned with the Aircraft Scheduling Unit at Dayton and aided in the development of the "Peterka Plane" which has been adopted by the RFC and ASU through its subsidiary, the MRC. A new committee working directly with the MRC is expected to be formed shortly.

The ASU is turning over its surplus stocks of aircraft materials now in the hands of contractors and subcontractors to the MRC which will contract with warehouses to act as sales agents. Warehouses will be permitted to inspect the surplus stocks and take on consignment those stocks which appear suitable. These will be sold at mill price ceilings with a com-

mission allowed, which is described as "adequate" by Mr. Doxey.

The warehouses will also be permitted to purchase of these stocks for warehousing. The MRC will allow the regular commission granted for out-of-warehouse sale and permit resale of the material to consumers at warehouse ceilings.

Warehouses are permitted to choose which surplus stocks will be acceptable to them thus posing the question of disposal of those stocks which no warehouses accept. There is also the problem of disposal of multitudinous small lots of material.

It is thought that many unacceptable small lots may be grouped into large miscellaneous lots and offered as scrap. The secondary warehouses may also enter the picture as an outlet for small lots or mixed lots which require segregation and reconditioning. To expedite movement of material even though mixed or in small lots it is expected that the minimum amounts eligible for arbitrary scrapping may be increased. Material in process that is unsuitable for resale for reuse will also likely become scrap under the final solution to the plan.

The terms of the contract are subject to review within six months which appears to leave an out for either the warehouse or MRC in case the plan needs early readjustment.

Report on Disposal Of Surplus Aircraft Highly Controversial

Washington

• • • A highly controversial report on the disposal of surplus aircraft and components prepared under the direction of Dr. Melvin T. Copeland of the Harvard Graduate School of Business Administration pursuant to a contract entered into by the War Department was made public on June 26.

The report, published by the Senate Military Affairs War Contract Subcommittee, is expected to draw the fire of aircraft manufacturers whose planes may have been improperly described, and from the whole industry on the question of salvaging planes and components which cannot be used, traded abroad or sold domestically.

The report concluded that the following planes will have no postwar commercial uses:

Heavy bombers—B-29 Tokyo bomber; B-32 (unnamed); B-17 Fortress and B-24 Liberator. Meduim and light bombers—B-25, B-26, A-20 and A-26. Fighters—P-38, P-39, P-47, P-51, P-61, etc. Miscellaneous tactical planes—photographic, attack, reconnaissance. Troop-carrying gliders—CG-3A and CG-4A.

Because of insufficient data the very heavy bombers were declared to be non-convertible. Fighters were so classified because of high gas consumption, being "too hot" for the skill of pilots not specially trained.

The report cast doubt upon the commercial usefulness of the following planes:

The Fairchild AT-21 and the Cessna UC-78—"Both ships possess poor load carrying ability when operated in accord with current civil air regulations. The AT-21 is heavier and has no proportional pay load advantages over the Beech UC-45. The Cessna UC-78 is slower and under existing gross weight limitations can probably carry only two or three passengers at the maximum as against six to eight for the Beech."

Lockheed Lodestar C-56-C-60 and A-18

Lockheed Lodestar C-56-C-60 and A-18—"This model is an intermediate sized two-engine transport. Its over-all cost of operation is nearly as high as the Douglas DC-3 while its capacity is only two-thirds as great. The Lodestar will have limited use in transport operations where the traffic potential is not large enough to justify use of the DC-3.

Curtiss-Wright Commando C-46—
"Maintenance costs, some potential users estimate might be relatively high. The C-46 to date has run the gamut of operational and maintenance 'bugs' that are present in new airplanes. But by the end of the war extensive military usage should have eliminated most of these bugs in the latest deliveries so that this plane should be satisfactory for commercial use."

AHEAD TIMES

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MURCHEY MACHINE & TOOL CO.

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Washington . . . L. W. MOFFETT

• We make our mark in the Swami Department ... Warren loses fight on contract cancellation settlements ... Speculation over whether aluminum will supersede steel in civilian production.



ASHINGTON—An award of a zinc-coated widget is claimed by this column for proficiency in "propheteering." Here's why.

On Aug. 5, 1943, we said: "A size-up of the prospects for more civilian goods forces the conclusion that by the end of the year inventories will be fair. Based on the present outlook, by mid-1944 the only demands which will be left unfilled will be for new automobiles and gimcracks.

"Factors which are persuasive to the belief that consumer goods soon will become more plentiful are: (1) the imminence of elections * * * *"

The recently announced chinkingin program of OCR for civilian production which does not hurt military
output, together with nearly a 100
per cent increase in a year, in the
amount of steel and other metals allotted for non-military output carries the point. New car production
is just around the corner in 1945.
OCR's production targets may not be
met for some time, depending upon
the degree and success of War Department opposition.

THE fight conducted by Comptroller General Lindsay C. Warren for authority to review all contract cancellation settlements was lost on June 17 when the House passed, in substantially the same form as approved by the Senate, the Murray-George contract termination bill.

While there is good cause for a

feeling of relief that Congress has disposed of this important and troublesome legislation, the leaving to the discretion of the various military contracting officers of all contract termination matters may result in a great deal of postwar litigation.

If contractors refuse to negotiate contract settlements and too many settlements are made to which businessmen cannot agree, it is obvious that the lack of uniformity in treatment which concerns have suffered in renegotiations can possibly lead to law suits which may last decades.

One thing that the procurement agencies can do which will lead to laying down precedents for similar businesses in the same geographic location is to publish regionally the findings of fact, legal conclusions, and settlements to insure absolute fairness.

There is no doubt that the procurement agencies should have the sole and final say and authority to enter into agreements fixing the value of all inventories, work in process and machinery. To try to closely account for the last bolt and the last pin would be as foolish and detrimental to the minimum dislocation of peacetime enterprise as Bernard M. Baruch said it would be.

N the other hand, there is a vast realm of agreement as to overhead and other items in the contract which may not be fraudulent or contrary to law may be against the best interest of the government. The General Accounting Office may not be able to withhold payment in such cases, but certainly can bring them to the attention of Congress.

If the General Accounting Office finds enough of such cases there may be a movement toward enactment of legislation allowing the audit of parts of the settlement where the GAO and the courts have settled the liability of the government to make certain payments.

The lack of definite standards in the Murray-George bill and in procurement agency regulations for the handling of the details of settlements will not only make difficult the work of contracting officers in the thousands of decisions which must be made but will hamper and delay settlements because of time consuming indecision. Deciding what is scrap is one such question and what material

CONTRACT TERMINATORS: In Washington, members of the special committee on the termination of war contracts discuss ways and means. The committee, composed of both Senators and Congressmen, must decide on 200 million dollars worth of contracts. Members are (l. to r., seated): Rep. Clarence E. Hancock, N. Y.; Rep. Hatton Sumners, Texas; Sen. James E. Murray, Montana; Sen. Edward Johnson, Colo.; Sen. Chapman Revercomb, W. Va. Standing (l. to r): Rep. John Gwynne, Iowa; Rep. Estes Kefauve, Tenn.; Rep. Francis Walter, Penna., and Sen. Chan Guerney, S. Dakota.



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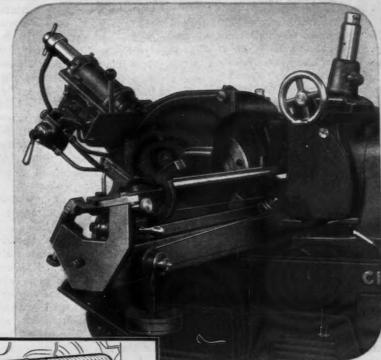
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Antifriction Race Grinding Fixture, with counterweight feeding device, mounted on a CINCINNATI No. 2 Centerless Grinder. The same type of equipment may also be applied to CINCINNATI No. 3 and No. 4 Centerless Grinding Machines.

Illustrated below is a standard CINCINNATI No. 2 Centerless Grinding Machine. Copy of Catalog G-456-1 which gives complete details and specifications, will be sent on request.



Here's another example of CINCINNATI Engineered Fixtures and how they add to the usefulness of CINCINNATI Centerless Grinding Machines. The fixture was designed primarily for grinding outside diameters of antifriction bearing races, but may also be used for other work of a similar size and shape. In the fixture shown above, parts are fed to the wheels through the action of a counterweight. For heavier and larger parts, near the capacity of the machine, fixture can be furnished with power-driving elements.

Before this grinding operation, parts must be surface ground on the sides so that when they are stacked in the fixture, they will align themselves with each other. As the parts enter the wheels, the length of stack is shortened, lessening the load for the counterweight to advance to the wheels. A cone pulley arrangement automatically compensates for this reduction in weight. This assures constant feeding and eliminates close operator attention. ¶ Many types of standard fixtures are available for centerless grinding a wide variety of parts made of all kinds of metal and metal substitutes. The engineers here at Grinding Headquarters will be glad to talk to you about the possibilities of centerless grinding a wider variety of work through the application of standard fixtures.

CINCINNATI GRINDERS INCORPORATED SINGINNATI, 9

CENTERTYPE GRINDING MACHINES ... CENTERLESS GRINDING MACHINES ... CENTERLESS LAPPING MACHINES

LTHOUGH not much has been Asaid about it, the question of what extent aluminum will supersede steel because aluminum has been released first by WPB for civilian production is causing speculation.

The price of aluminum is about five times that of steel, and hardly anyone assumes that it will ever become less than three or four times more expensive. Consequently, those who predict the substitution of aluminum for steel in automobile bodies and other large general applications are very likely indulging in wishful thinking.

On the other hand, aluminum may cut into markets where price is not an important factor and extreme tensile strength is not required. Handles and decorations for ice boxes, electrical appliance housing, tool handles and applications requiring relatively small amounts of metal may be made of aluminum before steel is available. Whether many of the substitutions will become permanent after steel is available in quantity seems to depend upon consumer buying preference and comparative cost, in the opinion of metallurgists.

Business Committee Advances Plan for FEA Disposal of Property

Washington

• • With a hope that foreign surplus property disposal will not interfere with future United States commercial exports, a business advisory committee laid down a plan for the Foreign Economic Administration to get rid of this property in a manner which will prevent charges that FEA is "incompetent," "dishonest" or 'guilty of favoritism."

Members of the committee whose plan was made public on June 21 are: Clark H. Minor, president of International General Electric Corp.; T. V. Houser, vice-president of Sears Roebuck & Co.; H. D. Bennett, president of the Toledo Scale Co; and J. A. Donaldson, vice-president of Butler Brothers.

Cardinal principles given by the committee to make the foreign sale of surplus goods efficient and honest were: (1) Employment of high caliber executives from business and experienced salesmen with qualifications to deal in many commodities; (2) all surplus sales should be made so far as possible through open competitive bidding to insure highest net realization and freedom from favoritism, and

(3) where bidding is impossible and sale is made through private negotiation, the negotiated price should be publicly posted for five days.

The United States Commercial Co., RFC subsidiary and FEA importing agency, is suggested as the selling corporation to dispose of property abroad within two years after the cessation of hostilities. The corporation would be divided into three divisions as follows: Operations; fiscal accounting and control; general sales. Regional disposal offices would be set up abroad in the major trading centers of the world to conform to the regular international movement of goods.

The plan covers disposal of lendlease goods, surpluses exported for reconstruction and relief, American owned foreign installations, foreign procured raw materials, enemy goods and military supplies.

The General Sales Division would be organized with sections to handle the following classes of goods:

Commercial, professional and office equipment; raw materials and scrap; industrial equipment and parts; automotive equipment; munitions; ships; airports; airplanes and industrial plants.

The report recommends that the following conditions of sale be followed by field disposal officers:

Title warranty—All sales must be made without warranty except as to title.

Return of goods to the United States—Generally, sales should be conditioned upon the buyer undertaking that the goods will not be returned to the United States. Original manufacturers are an exception. They may

the buyer undertaking that the goods will not be returned to the United States. Original manufacturers are an exception. They may buy goods for re-export where the purpose is to recondition merchandise to protect trade name in resale.

Prices—Small Lots. The field disposal officer should be authorized to sell all small lots at the best price obtainable subject to adequate explanation of prices falling below the price he recommended in his disposal plan as the probable market value.

Large Lots. All the large lots should be offered for sale subject to an upset price (which should not be published). This upset price should be recommended by the field disposal officer and confirmed from Washington. On failure to sell because the upset price is not reached, the field disposal officer should make new recommendations to Washington unless he can obtain the upset price through private negotiations.

Speed of Sale—The field disposal officer should be instructed to avoid depressing prices by selling with needless speed. On the other hand he should be informed that it is the tentative policy of FEA to dispose of all but the largest lots within about two years. Nevertheless it should be made clear that this period of disposal will be reviewed from time to time.

Credit—The government should be prepared

to time.

Credit—The government should be prepared to sell on credit using in general the same criteria of an acceptable risk as would be used by a private business. But where cash offers are approximately equal to credit offers cash should be preferred.

Short term credit should be within the authority of the field disposal officer to grant, subject to general limitations prescribed in Washington.

THE BULL OF THE WOODS

BY J. R. WILLIAMS





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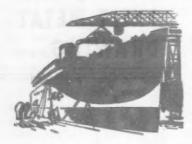
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BIRMINGHAM . CHICAGO . CLEVELAND . LOS ANGELES . NEWARK . PHILADELPHIA
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• Visiting engineers have no word for absenteeism, but prime problem in Pacific Northwest just now is to hold 'em on the job . . . Inland surrenders Richmond and Rheem mans abandoned facilities.



EATTLE-When a recent four man purchasing commission of Russian engineers visited the shipyards in the Portland and Seattle areas, the greatest difficulty they seemed to encounter was to understand the term "absenteeism." When they finally comprehended what was meant by the word they assured their hosts that in Russia one does not take a day off irresponsibly. All Russians are employees of the U.S.S.R. and an absentee either goes to jail or to the Army. But it is no problem, according to the commission members, because the people are so concerned with winning the war against Germany that no one thinks of staying away from work or loafing on the job.

According to these technical semiofficial visitors, skilled Soviet workers receive about the same wages as American journeymen, between \$280 and \$300 a month. Top ranking industrial executives receive approximately \$1000 a month salary plus a bonus. The average workman pays around \$38 a month for a five room house in normal times. Women are paid the same wages as men and in the shipyards they are filling 38 per cent of the jobs. All shipyard workers are paid on a piece work basis, getting higher wages for better individual production.

To those who met the four Russian engineers and talked with them, it all sounded much more enviable than reports from Russia used to sound five or 10 years ago. In fact, it sounded especially ideal to the personnel procurement people, recruiting offices and employment officials in the Seattle area who are staging a great "stay-on-the-job" campaign which comes to a climax with a big pageant in the University of Washington stadium on July 4 when an Army show will be staged along the lines of one last fall that was necessary to recruit workers for Boeing. High ranking Army officers will be on hand and materials made in the Pacific Northwest will be displayed. It is a joint effort of industry, business. municipal, War Mangower and military officials to keep workers from leaving for home or surrendering war work jobs for easier, more normal, possibly longer lasting work.

In spite of canonization of the B-29 super-fortress which should assure its production for the next 12 or 18 months in any case and under any circumstances, and despite the fact that major shipyards, including the Bremerton Navy Yard, have practically positive assurance of work and contracts for every present worker through 1945, in practically any case -even in spite of top wage scales, overtime, improved housing and transportation, expensive in-plant feeding and seemingly every inducement-morale of workers is low and many hearts, thoughts, intentions and wishings are elsewhere.

Front pages thrill with favorable news from Italy, from Normandy, from the Mariannas and from every front, but War Bond sales lag and workers pass up overtime and job seniority to lay off and quit.

Pacific Car & Foundry Co., Renton, thought they would tear a leaf from the month-long defiance of AFL Machinist Lodge 68 at San Francisco. So they notified the management that they would hereafter refuse to work more than 48 hr. per week or 8 hr. per day, "pending a new contract." Within a day or two, and apparently as a result of effective pressure from national head-quarters and from AFL officials in the Puget Sound area, the ultimatum was withdrawn and the 53 hour week restored. An appeal still stands with

WLB for an adjusted wage scale.

Even the arrival and personal intervention of International President Harvey Brown had not changed the solid front of Lodge 68 with its business agents, Harry Hook and Ed Dillon, at San Francisco, and WLB has certified the dispute to the president's office. This involves all workers in uptown shops, members of the Metal Trades Association. "Unsatisfactory" machinists' wage scales in the Puget Sound area recently approved by WLB range from \$1.401/2 for tool and die makers, \$1.25 for four-year journeymen on the job for 30 days to \$1.06 for machinists specialists.

In a general summary and appraisal of shipbuilding in its 12th District, the Federal Reserve Bank estimates that Pacific Coast shipyards have chewed up 3,000,000 tons of steel in each of the last two years and that 600,000 persons are currently employed in some 200 shipbuilding plants from Bellingham, Wash., to San Diego, with probably well over 100,000 others in such ancillary industries as foundries, machine shops, forging and engine building and prefabricating establishments. Backing up the 200 assembly yards on tidewater are 380 prime contractors in 45 interior counties. The Mare Island Navy Yard alone which farmed out little or no work prior to the war has about 190 prime contractors and more than 300 subcontractors in California, Utah, Colorado and Wyoming, employing some 25,000 persons. The total value of contracts placed with West Coast shipbuilders since June, 1940, approximates seven billion dollars. The number of persons now employed in shipbuilding and aircraft on the West Coast is about 75 per cent above the total number of all manufacturing employees in the district in 1939.

Because government owned properties were recently held tax exempt for local tax purposes by a Supreme Court decision, the King County assessor in the Seattle area dedeclares that over \$500,000,000 worth of property in that county is exempt from taxation, the largest portion of which is federally owned, with an estimated value of \$185,000,000. The

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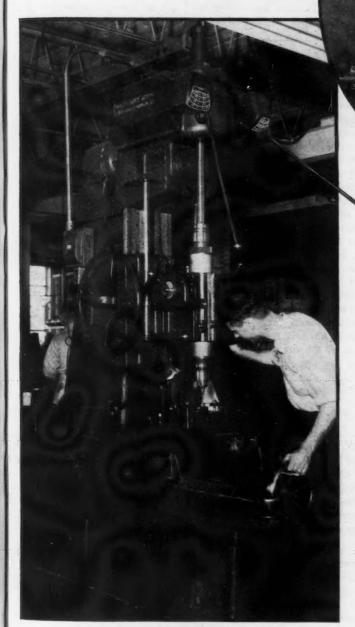
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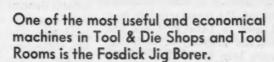
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Its versatility in handling a wide variety of work—its simplicity of control and operation—its moderate initial cost—and its dependable precision make it most desirable for the production of small lots and for precision die and tool work.

The Fosdick Jig Borer shown is operating in the plant of the Stellar Tool & Gauge Co. It illustrates a typical setup for a precision drilling operation in a tool and die shop.

Its rigid, sturdy construction and conveniently located controls enable the average shop man to operate the machine accurately without long experience and produce precision work at low cost.

Consult Fosdick on your precision drilling—boring—and reaming operations. For detailed description of machine and examples of typical jobs write for Jig Borer Bulletin J.B.I.

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assessor estimates that 40 per cent of the wealth of the county is now off the tax rolls and 42 per cent of the area of the entire state of Washington is now owned by the Federal Government.

Postwar aluminum price is likely to be around 9c. a lb., with magnesium about the same price per unit of volume (or 14c. a lb.), according to Prof. Eri B. Parker, supervisor of light metals research at Washington State College, Pullman. He believes that the main industrial hope of the Pacific Northwest for postwar continuity is in substitution of light for heavier metals and in developing light metal processing to Pacific Northwest resources and opportunities.

zfr.

SAN FRANCISCO—Inland Steel has withdrawn from its Pacific assembly outpost. Having completed a Navy contract for the final fabrication and assembly of steel containers at Richmond, the machinery has been shipped back to Lake Michigan and the plant and property at Richmond which have been operated as the Inland Steel Container Co. have been sold to the Rheem Mfg. Co. for approximately \$70,000. Rheem will use the additional space in connection with its extensive operations in the fabrication of steel containers and plate and sheet products at Richmond. With its main works and source of supply so far from tidewater, Inland could only operate on the West Coast on a rail shipment basis, prohibitive postwar when inter - coastal ocean shipments are resumed.

Ralph C. Noah of the San Francisco Iron Foundry and Alfred J. Snow of Snow & Galgiani are the new president and vice-president of the Northern California chapter of

the American Foundrymen's Association. H. A. Bossi of the H. C. Macauley Foundry Co., Berkeley has completed a successful year as president during which time the chapter added 58 new members to bring the total to 267.

Labor members of the 10th Regional War Labor Board recently disapproved a joint appeal by the Pacific Telephone & Telegraph Co. and its employees for a flat \$2.00 per week

wage increase. Sixteen independent unions represent these approximately 37,000 coast-wide employees. The telephone company, the employer, favored the increase, as did members of WLB representing management and also the public members. CIO and AFL labor members disapproved. Independent unions are not represented on the board and it appears from this case that representatives of "labor" and "workers" are in reality representatives of CIO and AFL unions only.

Thomas Asks for Freight Rate Cut

Washington

• • Senator Elbert D. Thomas, Democrat of Utah, has written a letter to Attorney General Francis Biddle expressing concern over the survival of the \$190,000,000 DPC-owned steel plant at Provo, Utah, unless freight rates from that point to the Pacific Coast are reduced. The Attorney General was told that the ultimate success of this plant will depend upon the price of the product and that one of the costs which has always hindered manufacturing expansion in the Rocky Mountain country has been freight rates. The largest outlet for steel, the Senator said, will probably be the Pacific Coast, "and the freight rate from Utah points to Pacific Coast points is at the present practically as high as the same rates from Chicago." He added that it will be only a matter of time before there will be demands by the people of Utah for a change of these rates.

The Senator declared that the situation was worthy of the most serious consideration of the Attorney General and of the consideration of Assistant Attorney General Berge in charge of the anti-trust division. The Senator told THE IRON AGE that the Department of Justice rather than the

Interstate Commerce Commission was asked to look into the situation because the department investigates government contracts.

The Thomas letter, however, complaining of high freight rates was a surprise since, it is reported, the government is allowed reduced rates on steel from Provo. This reduction in rates was said to have been granted DPC under Section 22 of the Interstate Commerce Act, the Geneva Steel Co. acting as agent and shipper for DPC.

Andrews Steel Co. Plant Leased by Defense Plant Corp.

Washington

• • • At the request of the War Department and WPB, the Andrews Steel Co. plant at Newport, Ky., has been leased by Defense Plant Corp. The plant is being operated by the company management under DPC direction.

This unusual action was taken after the Andrews company had advised the War Department that the company could not continue to operate on a solvent basis after July 1 and would have to close its plant on that date unless the Government took action. It is said that the company offered to sell the plant to the Government but that instead of accepting this proposal the War Department and WPB asked DPC to lease the plant and have it operated by the company. Under the terms of the lease DPC pays all overhead costs and pays a fee to the company for its services. The Andrews plant is making shell steel for the Army. The plant has seven open hearth furnaces and rolls slabs, billets, sheet bars and plates.

The Andrews situation has developed considerable interest because the plight of that company is similar to that of other small steel plants that either are making little or no profits at present prices.

... Cited for Awards ...

• • • • The following companies have won the Army-Navy E award for outstanding war production:

Summerill Tubing Co., Bridgeport, Pa. (second star)

American Machine & Metals, Inc., East Moline, Ill. (third star)

Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. (star) Hamlin Metal Products Co., Akron, Ohio. Wisconsin Steel Works, International Harvester Co., Chicago.

vester Co., Chicago. Skilsaw, Inc., Chicago. (second star) Mathieson Alkali Works, Saltville plant, Saltville, Va.

Falk Corp., Milwaukee. (third star)

Power Piping Unit, Blaw-Knox Construction Co., Ambridge, Pa.

Converse Bridge & Steel Co., Chattanooga, Tenn.

Maritime M

Marinship Corp., Sausalito, Cal. (second star)
Dean Brothers Pumps, Inc., Indianapolis.
Dutchess Tool Co., Inc., Beacon, N. Y.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Imperial Lifeboat & Davit, Athens, N. Y.
Instrument Laboratory, Inc., Seattle.
Johnston Pump Co., Los Angeles.
Kieley & Mueller, Inc., North Bergen, N. J.
Majestic Mfg. Co., St. Louis.
Reliance Gauge Column Co., Clevelaud.
Steel Products Corp., South Windham, Me.
Multnomah Iron Works, R. M. Wade & Co.,
Portland, Ore.



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- B. L. McCarthy has been appointed assistant general superintendent of the Buffalo plant, Wickwire Spencer Steel Co.; C. A. Gordon has been made superintendent of Hot Departments. Mr. McCarthy was formerly chief metallurgist of Wickwire Spencer.
- C. H. Lage has been appointed general works manager of LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Ia. He will have charge of all plant operation and production. Mr. Lage comes to LaPlant-Choate from Universal Unit Power Shovel Corp., Milwaukee, where he was vice-president in charge of manufacturing.
- Charles O. Drayton, formerly general sales manager, has been elected vice-president in charge of sales, American Screw Co., Providence; George H. Reama, formerly factory manager, has been elected vice-president in charge of manufacturing.
- · Arthur S. Shoffstall has retired as general manager of the Huntington Works of the International Nickel Co., Inc. He will continue as a consultant to the head office of the company. Mr. Shoffstall joined International Nickel in 1908, and under his direction, the Huntington Works, largest of International Nickel's plants in the United States, began operations 22 years ago. Herman M. Brown, assistant general manager since 1921, has been made general manager and John A. Marsh, general superintendent, has been named assistant general manager.
- W. L. LOHRENTZ, secretary and assistant treasurer, Tubular Alloy Steel Corp.



PERSONALS

- J. Edward Donnellan, of the American Society for Metals, Cleveland, has resigned from that organization to join the General Alloys Co., Boston, as vice-president in charge of sales. In 1924, Mr. Donnellan joined the American Society for Metals as secretary to its National Technical Committees, the position in which he served for the past 20 years. He edited the nationally known Metals Handbook.
- E. R. Galvin, general sales manager for R. G. LeTourneau, Inc., since 1938, has resigned to become president and a director for the Tyson Roller Bearing Corp., Massillon, Ohio.
- John M. Otter has been named sales manager for the Home Radio Division, and Walter H. Eichelberger has been appointed sales manager for the Refrigerator Division, Philco Corp., Philadelphia. Mr. Otter, who for the past four years has been Philco sales manager for the Middle West, joined the company in 1926. Mr. Eichelberger joined Philco in 1936 and since 1941 has been manager of Philco's Atlantic Division.
- William L. Rodgers has joined the Goodyear Tire & Rubber Co.'s Mechanical Goods Department to handle V-Belt sales in the Chicago territory. Mr. Rodgers came to Goodyear from the Dayton Rubber Co., Chicago.
- S. F. Udstad, after two years with the WPB Transportation Equipment Division, has returned to the American Car & Foundry Co. as assistant to the general mechanical engineer with headquarters at Berwick, Pa.
- · C. E. Magoon has been appointed treasurer and assistant secretary and W. L. Lohrentz, secretary and assistant treasurer, of the Gary, Ind., plant of Tubular Alloy Steel Corp., U. S. Steel Corp. subsidiary. Mr. Magoon, who also was elected to the board of directors, began his career with the Corporation in 1939 as a member of the audit staff of the Carnegie-Illinois Pittsburgh office. He was transferred to Tubular Alloy Steel Corp. in 1942, as assistant to the treasurer, and elected assistant treasurer a year later. Mr. Lohrentz was appointed assistant to the secretary of Tubular Alloy Steel Corp. in 1942.

- Samuel J. Kornhauser has been elected president National Tool Co., Cleveland. He succeeds the late Arthur J. Brandt. Since 1941, Mr. Kornhauser had been executive vice-president of the company and prior to that he had been connected with the company for 25 years as general counsel, secretary, director and member of the executive committee.
 - James R. Page, Robert S. Burns, George B. White and Howard F. Isham have been elected directors of the Cherry Rivet Co., Los Angeles.
 - J. J. Schaefer has joined Wyandotte Chemicals Corp., Wyandotte, Mich., as director of their new Development Department. Prior to joining the company he was vice-president of Sharples Chemicals, Inc.
 - C. P. Randall has been appointed service engineer in the New England territory for Hickman, Williams & Co., New York. For the past three years he had been service engineer for Eastern Clay Products, Inc., Eifort, Ohio.
 - S. D. Yardley has been made assistant district sales manager of Republic Steel Corp. at Birmingham, Ala. Since 1939 he has been assistant manager of sales, Sheet & Strip Division, Cleveland.
 - Otto Z. Klopsch has resigned as vice-president and director of Calumet & Hecla Consolidated Copper Co. and general manager of the Wolverine Tube Division. H. Y. Bassett has been made acting manager of the Wolverine Tube Division.
 - C. E. MAGOON, treasurer and assistant secretary, Tubular Alloy Steel Corp.





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C. T. SIEBERT, JR., manager of sales, Lorain Products Division, Carnegie-Illinois Steel Corp.

- C. T. Siebert, Jr., has been named manager of sales for the Lorain Products Division, Carnegie-Illinois Steel Corp., Pittsburgh, with W. H. Friedline as assistant manager. Mr. Siebert has served this U. S. Steel subsidiary since 1917, holding various positions in the engineering, treasury, and sales departments. Mr. Friedline has been associated with Lorain Division sales at Johnstown, Pa., since 1907.
- James E. Britt has been appointed general sales manager of the Contract Division of Mullins Mfg. Corp., Warren, Ohio. He succeeds O. L. Earl, who ends an 18-year association with Mullins to take a position with Acme Aluminum Foundries Co., Chicago, as vice-president and member of the board of directors. Mr. Britt has been sales manager of Mullins Automotive Division and came to the company in 1925 from Westinghouse Electric & Mfg. Co.
- Ernest Mahler, executive vicepresident of the Kimberly-Clark Corp., Neenah, Wis., has been elected to the board of directors of the Allis-Chalmers Mfg. Co., Milwaukee. He succeeds R. G. Hutchins, New York, who retired after 31 years of service on the board. John J. Kane has been appointed general patent attorney of the company, succeeding George F. DeWein who resigned after 40 years in the Allis-Chalmers patent organization.
- Lee Stratton has been made manager of refrigeration of the Manufacturing Division, Crosley Corp., Cincinnati.

- A. C. Scott has been named vicepresident in charge of sales for Apex Electrical Mfg. Co., Cleveland. He has been sales manager of the Apex Central Division and director of war sales.
- D. W. McGeorge has been elected vice-president and general sales manager; and L. M. Forncrook has been elected secretary, Edgewater Steel Co., Pittsburgh.
- F. A. Schaff, president, has been elected chairman of the board, The Superheater Co., Ltd., of Montreal. He is also president of the associate company, The Superheater Co. of New York. C. A. Odell has been elected president; H. E. Brown and G. S. Thomson have been made vice-presidents.
- John H. Rowe, for the past several years Chicago manager of Boston Woven Hose & Rubber Co., has been made vice-president in charge of Western sales, covering the territory from Chicago to the Pacific Coast. Stuart A. Guild will become manager of the Chicago office.
- Harold J. Ritter, vice-president, has resigned from the Norma-Hoffmann Bearings Corp., Stamford, Conn. Mr. Ritter has been with the company for 28 years. His future plans have not been announced.



GEORGE M. LANGE of the Fuel Injection Division, Ex-Cell-O Corp.

- George M. Lange, has joined the Fuel Injection Division of the Excell-O Corp., Detroit. With the Timken Roller Bearing Co. until joining Ex-Cell-O, he has been in Washington for the past two years serving as a consulting engineer with WPB.
- Norman F. Melville, manager of steel and wire sales for Pittsburgh Steel Co. has joined the Rod and Wire Department of WPB in Washington.

OBITUARY...

- William C. Reilly, 76, retired vicepresident of the Youngstown Sheet & Tube Co. and co-builder with James A. Campbell, former president, of the company's plants in the Youngstown district, died recently. Mr. Reilly retired in 1936.
- Leon W. Briggs, for the past eight years assistant manager of the Sheet and Strip Steel Sales Division of the Weirton Steel Co., died June 18 in Steubenville, Ohio.
- Henry C. Atkins, Sr., president, E. C. Atkins & Co., Indianapolis, died June 15, following an illness of several months. He had served as president of the company since 1901.
- William B. Cordes, marine engineer with the New York office, General Electric Co., died recently. He was 63 years old. Mr. Cordes was employed by the company at Schenectady in 1900 and had a record of 44 years of continuous service.

- William W. Hebson, 50, office manager at the Chicago South Works of Carnegie-Illinois Steel Corp., died suddenly June 6. An employee of Carnegie-Illinois and predecessor companies for 34 years, he had been attached to the general superintendent's staff since 1916.
- Oliver W. Spencer, vice-president of the Southern Wheel Division, American Brake Shoe Co., New York, since 1939, died June 18. He was 52 years old.
- Robert Grant, 77, head of Robert Grant Co., New York, steel exporters and jobbers, died June 18. Mr. Grant, who had been in this business for 57 years, organized the Robert Grant Co. in 1904.
- Joseph F. Reed, president and treasurer of Kol-Master Corp., stoker manufacturers at Oregon, Ill., died June 12 at the age of 63 years.
- C. C. Levy, industry engineer, metal working section, Westinghouse Electric & Mfg. Co., East Pittsburgh, died suddenly, June 5. He had been with the company since 1913.

No Cheers, No Hisses

• • • Our two-man crusade to enhance the delights of rail travel by placing station names where they can be seen has so far created no more of a stir in railroad circles than the entrance of a one-star general into the Statler Washington bar. No railroad president has written, "Best idea since Westinghouse invented the air brake." The Association of American Railroads has not condemned it roundly.

The deafening silence may be part of the railroad people's code not to parade their feelings in public. For all we know it may be the burning topic of conversation at railroad clubs all over the country. But on the chance that it is not, we are in the market for a blood donor high in red count. Our preferred candidate is Edward G. Budd, who was recently quoted in your favorite family journal as saying:

I foresee an opportunity not only to hold the present volume of passenger business, but actually to increase it.

As Mr. Budd makes streamliners the Budd blood would introduce a healthy element of self-interest into a cause whose veins up to now have been filled with nothing but the watery fluid of pure altruism.

Dog Food vs. Waterfall

• • • What Mr. Budd terms "the irrepressible urge in the average American for travel" can be heightened in still another way — by urging manufacturers whose factories are along the right of way to erect identification signs. A diet of straight scenery soon tires the traveler. After an hour of it a sign reading "No-Bark Dog Food Is Made Here" is likely to excite him more than a 40-ft. waterfall.

But much of the enormous publicity value of plant locations fronting on railroads is now wasted, for the plants that are properly identified even in daylight are in the minority. And fewer bother about after-dark labeling. Our v.p. and g.m., Charles Samuel Baur, says he lay awake one night in a lower and counted the proportion of plants having electric signs. The number was one out of ten.

There are, of course, exceptions to the rule that it pays a plant to identify itself to travelers. One of the food products plants on the railroad route between New York and Philadelphia looks so dirty and bedraggled that the removal of its sign would certainly boost its sales.

Aptronym

I see by the marriage section of the New York Herald-Tribune that the A.A.F. has a meteorologist named Major Charles Stanley Wetterer.

-R. E. B.

Ferryboat Phrases

• • • A couple of weeks ago we mentioned that a Chicago reader, who runs a plating plant, has a name that reads the same fore and aft, to wit, Ronnoc Connor. When we registered this scoop we knew there was a fancy word for it, but it escaped us.

The word is now supplied by both I. H. (Stauffer, Eshleman & Co., New Orleans, est. 1820) Stauffer and Ernest C. (Clark Controller Co., Cleveland) Roberts. The word is palindrome. Palindromes are as old as the race. We have it on the authority of Mr. Roberts himself that the first man introduced himself thus, "Madam, I'm Adam."

Mot of the Moment

• • • No. 1 on the Washington word parade at the moment is "tempo," as in "step up the tempo." Tempo is on every front man's tongue. Styles in words spread in the Capital like measles in the fourth grade, and last about as long.

"Gad, What Responsibility!"

• • • We wish something could be done about the current rash of advertisements showing pictures of captains of industry staring out of king-size office windows overlooking acres of plant, looking noble and indomitable, with hands clenched, and shoulder-deep in self-communion.

Our acquaintance with captains of industry and their habits is decidedly sketchy, but we don't think they are over-given to introspection, and it is probably a good thing, for if they permitted their responsibilities to overawe them they would get stomach ulcers.

Instead of being of the tense, clenched fist type, we think the good leaders, like the men who get the most out of a brassie, are relaxed. If Generals Eisenhower and Montgomery allowed themselves to be overwhelmed by the cosmic importance of their jobs, they would lose sleep, which would result in the heeby-jeebies, and soon there would be hell to pay.

Therefore, will the people who draw pictures for advertisements hereafter please show the captain of industry in the usual pose at his desk, checking over a pink expense slip and wondering whether the v.p. in charge of sales is lucky enough to get a drawing room on every trip, or whether he just charges for it anyway.

Stopper

• • • No aspirin comes with this steel wire . . . Wickwire Spencer Steel Co.

Blurk

• • • If we purred every time your favorite family journal is first with the news the effect would be that of a jet plane at cruising speed, which would lull you to sleep. But we will risk a yawn just to keep our franchise:

Here (in the Karelian fields) the Russians tried out a new anti-mine device—a revolving harrowlike contraption, which was pushed ahead by a tank to crush enemy mines.

—New York Times, June 19, 1944

The British now use a large sectional tubular framework which can be pushed forward a hundred yards or so, plowing the ground and setting off the mines.

-News Front, Oct. 7, 1943, IRON AGE

Fodder for Political Cuds

• • • As it may be of some value to the Chicago conventions we release the results of a survey we have made of the prevalence of "New Deal" in firm names. New York City is still first with 28, from the New Deal Apartments to the New Deal Uniform Co., between which are New Deal bristles, laundry, laundry goods, liquors, luncheonette, machinery, overalls, plating, terrazzo coats and assorted other businesses. There is, of course, a New Deal Democratic Club, but no New Deal Republican Club.

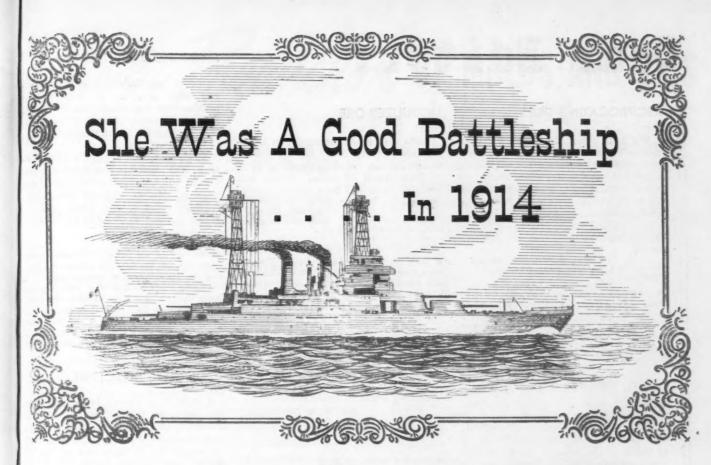
Chicago is second with 15 New Deal firms. Detroit and Los Angeles split third place with six each. Philadelphia has 4; Baltimore and Buffalo have three each. Cleveland, San Francisco, St. Louis and Baltimore each have only one reminder of the business titling—tidal wave that swept over the country in the early '30s, and even splashed over the borders, as evidenced by the fact that Toronto has its New Deal Groceteria.

Puzzles

• • The money should be divided among last week's hamburger buyers thus: A should get 12c, and B 18c, Count yourself extra bright if you figure this out in your head within 90 seconds:

A and B start out in separate cars for a point 100 miles distant. A travels an even 50 miles an hour going and returning. B averages 60 m.p.h. going but only 40 returning.

Which makes the trip in the better times



CRANE BUILDING has advanced too

Queen of the fleet in 1914, it was the best that naval engineering could produce. But it can't compete today with swift modern war greyhounds. Improvement has overtaken it. While it is still seaworthy, it is too slow and unwieldy for modern battle.

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Cranes have improved too. Those old cranes you may have may be perfectly sound—almost as good as the day you bought them. But they are too slow and unwieldy to keep up with the production speed of the rest of your equipment.

You can increase your plant production-reduce

handling costs, by replacing them with new Northern Cranes. These are faster, more powerful, stronger, have finer control, require much less attention.

MODERN NORTHERN CRANES SPEED PRODUCTION

Faster material handling in greater volume increases production of your whole plant—quickly pays the cost of new Northern Cranes.

Write for details on Northern Cranes—Northern Super-Cranes—Northern Hi-Lift (Low Headroom) Cranes.



Dear Editor:

RECIPROCATING DRILL

Sir:

We note from the June 8 "Dear Editor" page that on June 17, 1943, you published information regarding a method of drilling steel which involves vibrating the drill to break up chips and speed up the operation. Unfortunately we missed this. Would you mind telling us the name of the firm that manufactures the attach-

FOLGER ADAM

Prison Cell Constructor, Joliet, Ill.

 Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago. The attachment, which causes the drill to lift slightly during every revolution, thus breaking the chips and permitting the lubricant to flow under the cutting edges, is known as the Rego Karweit Driller.-Ed.

UNITED EFFORT

I would like to have two copies of "United Effort," the editorial by J. H. Van Deventer in your June 15 issue. If there is any charge kindly advise and remittance will be forwarded.

N. M. GRON, Purchasing Agent

Howe Scale Co., Rutland, Vt.

• No charge.-Ed.

BRAZED SIGHTS

Your June 1 issue contains an article, "Carbine Sight Made From Brazed Stampings." Will you kindly furnish 30 copies and let us know the charge? W. E. LOUGHRAN

Prestole Division, Detroit Harvester Co., 4500 Detroit Ave., 4500 Detroit Toledo, Ohio

Sorry we cannot furnish that many clippings. Paper rationing requires us to keep our printing run down to subscribers' re-quirements. However, you have our per-mission to make photostats.—Ed.

STEEL JOBBERS DIRECTORY

On the June 15 "Dear Editor" page you say in answer to an inquiry, "We know of no one publishing a complete list of steel jobbers." Such a directory is published by the WPB. Its name is, "Directory of Warehouse Distributors of General Steel Products," as defined in General Preference Order M-21-b-1, dated April, 1944, cost 15c., edited by J. R. Stuart, Chief Warehouse Branch, Steel Division, Washington, D. C., obtainable from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C.

WILLIAM J. NOBLE National Tube Co., 71 Broadway, New York 6

• Thank you.-Ed.

NODULIZED ORE

Sir:

I am very much interested in knowing whether reprints have been made of the article, "Nodulizing Iron Ore," in your April 27 issue. If so, will you tell me how I may obtain several copies.

A. J. GAILEY, Chemical Engineer Niagara Works Niagara Works, Niagara Falls, N. Y.

 Reprints were made by Day & Zimmer-mann, Inc., Packard Bldg., Philadelphia 2, with which the author of the article, Gilbert E. Seil, is connected. Copies may be obtained without charge by application to that firm .- Ed.

DYNAMITING BROKEN DRILLS

Where can I secure data on blasting broken drill points from semidrilled oil holes in crankshafts?

> KNOX A. POWELL, Research Engineer

Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

• See the article on page 73 of the Feb. 10 Iron Age describing the method of re-moving broken drills with dynamite. For additional information, write to the Ohio Crankshaft Co., 6600 Clement Ave., Cleveland I .- Ed.

BROKEN TAPS EXTRACTOR

Where can we obtain additional information on the Thomas Tap Extractor described in the article, "Brod Taps Disintegrated Electrically," "Broken your May 4 issue, page 60?

THOMAS E. SALMON, Purchasing Agent

De Laval Steam Turbine Co., Trenton, N. J.

 The Thomas Tap Distintegrator is made by the Clinton Machine Co., Inc., Clinton, Mich. Sales office is at 8240 Harper Ave., Detroit. Don Thomas is the president. We suggest you write him at the Detroit address for additional information.-Ed.

COAL CARBONIZATION

We are anxious to locate some authoritative publications on modern coal carbonization and coal tar and tar derivatives, particularly from the point of view of the production of the finer chemicals and derivatives generally. Your recommendations will be appreciated.

Stewarts & Lloyds, Ltd., Corby, near Kettering,

Far more has been done in England than here along this line, and in consequence English literature on this subject is superior to this country's. Most likely American sources are Coal Age, 330 W. 42nd St., New York; Industrial and Engineering Chemistry, same address, and other coal and chemical publications.—Ed.

SPRINGFIELD GRINDER

Would appreciate any assistant you may give us in locating t parties now manufacturing a vertice surface grinder formerly built the Springfield Manufacturing Co Bridgeport, Conn.

The above firm is now out of bus ness and we are certain someon bought the manufacturing rights and is in a position to build this equip

H. R. WINTERHOFF Winterhoff Machinery Co., 2842 Woodward Ave., Detroit 2

 As far as we know, this concern he been out of business for about 25 year and its line of vertical surface grinders not being made by any other manufacturer Since the machine is an orphan, about the only way you can obtain spare parts it to have them made up in a job shop from the original worn parts. Castings, even broken, can be made to serve as pattern

TOOL STEEL DIRECTORY

Sir:

I note in a recent issue that you are able to furnish copies of the Directory of Tool Steels. Such a directory would be of great value to us and we would like to have two copies. If there is any charge, please bill us.

VANCE O. HILL, H. W. Loud Machine Works, 969 East Second St., Pomona, Cal.

• The price is \$1 each for five copies or fewer. For six or more the price is 50c each.

CASTING VS. WELDING

We are interested in the article "Cost of Meehanite Castings versus Welded Structures," which appeared on page 78 of your May 18 issue. We would like to get two copies of this paper.

G. HANNAY.

Barnett Foundry & Machine Co., Lyons Ave. and Coit St., Irvington, N. J.

COUNTY POP. CHANGES

Could I get a copy of the map showing the estimated per cent change in civilian population by counties? This map was on page 96 of your Apr. 6 issue.

A. K. WEINSTBIN Curtiss-Wright Corp., Bloomfield, N. J.

• We are glad to send you a clipping-

METAL POWDER

Page 55 of your June 1 issue has an article concerning the Metal Powder Association. What is the Association's address?

F. W. COURTNEY, President

Clarkiron Reduction Corp., 323 W. 6 St., Los Angeles 13

• 60 E. 42nd St., New York 17. The secretary is Mr. R. E. Ferry.—Ed.

Faster Production OF MOLDS AND DIES

on the MONARCH SHAPEMASTER

You can turn one or any quantity of mechanically perfect molds, dies, punches or similar shapes on a MONARCH SHAPEMASTER from four to five times faster than by other methods.

One master cam will reproduce literally thousands of different round, oval or other shapes on the outside, inside or face of the work. With Monarch-Keller electric controls and a thin metal template you can turn the most intricate contours with precision and speed.

We cannot equip your present lathes with Monarch-Kelly attachments, because they must be built in at the factory. However, we can demonstrate on actual work the value of this equipment . . . and we'll gladly study test samples or blue-prints to determine the utility of MONARCH SHAPEMASTERS for your tough jobs. We can make fairly prompt deliveries for War production. An inquiry to Sidney, Ohio, or to one of our convenient field offices will bring fast action.

THE MONARCH MACHINE TOOL COMPANY . SIDNEY, OHIO

Direct factory branches at Chicago • Cleveland • Detroit Newark • Pittsburgh • Representatives in principal cities.

MONARCH LATHES
Save Time



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This Industrial Week...

- Lower Level in Steel Order Volume Offset by Ingot Decline
- Manpower Shortages and Strikes Cut into Steel Output
- Substantial Expansion in Shell Steel Program Set for January

HILE the influx of fresh steel orders this past week settled down to a slightly lower level than in previous weeks, this was more than offset by a decline in the steel ingot rate caused by heat, manpower shortages, strikes, and equipment repairs. The slight decline in the volume of new bookings is not taken as an indication of a slowing up in the rate of ordering as most steel requirements are on a quarterly basis and the load changes upward and downward from week to week.

With uneven product loads at various steel plants, WPB was said to be attempting this week to redistribute production directives for flat rolled products during July. It is probable, however, that delivery schedules will not be met on substantial tonnages of material in the next few months due to the heavy carryovers on plates and sheets at some plants. No easing in orders is apparent and continued heavy requirements for the shell steel program and the Maritime Commission have the effect of further tightening a steel market which is now tighter than at any time during the past few years.

The continued demand for plates from the Maritime Commission, a recent increase in the shell steel program, and further evidence of an unbalanced product mix are seen as factors which will make the steel situation more serious as the industry proceeds into the third quarter. About the only factors which could change this state of affairs would be substantial cutbacks or cancellations in certain war programs, both of which are unlikely unless news from Europe in the way of a German defeat materializes in the near future. Steel officials are not counting on this for the reason that orders are being placed and must be produced until instructions to the contrary have been issued.

ALTHOUGH there was a lull in the number of outlaw strikes during the early days of invasion, in recent weeks an expansion in these work stoppages has occurred. These have had the effect of not only losing actual steel output, but slowing up the production of finished items as well. Linked with the work stoppage factor has been the growing seriousness of the manpower shortage which alone in many plants throughout the country has cost thousands of tons of steel and steel products. One large tilting open hearth furnace in one major steel center was closed down this week due entirely to labor shortages. At one of the country's largest and modern wire plants, it was said, rod mill machinery, which has been installed, is inactive because no one is available to operate it. Coke and pig iron production scheduled to start last week at Republic's South Chicago mill failed to begin because of labor shortage. For the first time this year, with the exception of the Christmas holiday strike, the ingot operating rate in the Chicago district dropped below 100 per cent with manpower being a major factor.

Railroad car requirements are said to be exceptionally heavy for the last quarter of this year and the first quarter of 1945. The War Department is taking bids this week on 34,666 freight cars of various types for 1945 and the Navy is asking quotations on 560 steel box cars. Heavy orders are being placed currently by the railroads for the final quarter of this year and the first quarter next year. The American Car & Foundry Co. has received an order from the New York Central system for 1000 55-ton box cars. It is said that unless the overall steel market situation takes a turn for the better, the current difficulty experienced by car builders in securing railroad axles and wheels will not be alleviated. The desire of the railroads to replace passenger equipment is reflected in the report that more than 700 such cars are on order books of principal suppliers. The possibility of passenger car construction this year is considered slight because of material scarcity.

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HE shell steel program, especially for the heavier sizes, has been expanded recently and it is believed shell steel requirements by late December or January, 1945, will run from 500 to 608 thousand tons a month. The program itself is expected to extend through June, 1945. While the actual production of heavy shell forgings will not utilize bar mills to any great extent, it will take such substantial tonnages of steel as to withhold billets from the bar mills. A greater part of the shell steel program will require steel rolled on billet mills, structural mills, and seamless tube round This presages an extremely tight situation over the next several months with respect to the availability of various types of semifinished steel. Cold drawers are expected, as far as possible, to be supplied with their hot rolled bar requirements due to their important part in the shell program through the manufacture of steel for fuses and other component parts of the shell program.

To be effective about July 5, OPA soon will announce an amendment to its steel price schedule increasing price extras on SAE 3100 and 4100 alloy steel and decreasing extras for NE 8600 and 8700 alloy steel. The purpose of the amendment is to encourage use of NE steels.

National steel ingot operations declined one and a half points to 96 per cent of rated capacity. District declines occurred in Pittsburgh where output dropped two and a half points to 91.5; Chicago, down one and a half points to 99.5; Buffalo, down two to 104.5; Western District, down eight and a half to 86.5, and Cincinnati, down eight to 86. Only two districts showed operational gains. They were Youngstown, up half a point to 98, and the Eastern District, up 12½ to 91.5. Philadelphia at 98.5; Cleveland at 94.5; Birmingham at 97, and St. Louis at 99 remained unchanged.

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• TANK INQUIRIES—Inquiries have been flowing in recently for substantial tonnages of alloy steel for transmissions etc. and for armor plate to meet requirements of the tank program which has been expanded. According to some sources there are indications that substantial orders for steel will be reaching mills in the near future, all with rush dates. This will further complicate the delivery picture, if it can become any more complicated than it now is.

• CONDITIONAL ORDERS—It is believed that the total volume of "conditional" orders in the steel industry is far from impressing. Such orders are those which are not placed on the order books nor do they hace any delivery dates. They are more or less a reminder that the consumer would like the steel when, as, and if he can get it once the controls are relaxed. One reason why the order volume of such "memos" is not large is because it is difficult for most consumers to plan definitely when they have no idea when they can get the steel or when they may start operations which would use the material.

• DG DAY—With everyone having D days, M days, etc., some steel people have started to label the day Germany is defeated as X day while others suggest DG (defeat of Germany). There is considerable thought as to what size of a decline will occur in orders, backlogs and rolling mill schedules. That there will be a decline in orders is a forgone conclusion in view of cancellations which will be put through. But there is no concrete evidence to suppose that all of the cutbacks and cancellations will come out of steel which is on the mills or in process. A large part will come out of the unfilled order backlog. Although some orders on the mill will be stopped in their tracks others may be for such items as can be used for other purposes. No one in or out of the steel industry is mitigating the serious impact the end of the European War will temporarily have on steel mill schedules and output. But also no one is forgetting the fact that civilian orders will not be long in building up the output and schedules that have been knocked off by war cancellations.

• JUNIOR PRIORITIES—In the conversation stage at Detroit is a newly suggested method of orderly controlled reconversion. Automobile people and Government officials

are discussing this pian which would be based on studies now being made by the Office of Civilian Requirements as to what constitutes the most necessary civilian goods and services at this time. Companies would make application for machines and materials to fill their production requirements and would be given priorities similar to War priorities now being issued. These would be filed by the companies with their suppliers and then on V day a simple series of telegrams from producers would authorize suppliers to get into action on the priorities held in file.

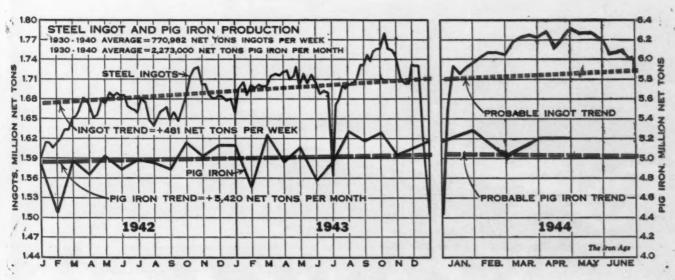
• BRITAIN AND POSTWAR STEEL—Great Britain, in trying to approximate its position in the postwar world steel markets, advances the idea of consolidating, integrating, and expanding its steel plants in order to compete with the highly integrated steel industries in America and Russia. Consideration is being given to the extent to which its 12 billion tons of low grade domestic ore reserves can be best utilized. There is a feeling of need for steel expansion in Britain not only to compete in world markets but to discourage British colonies from developing any steel making potentialities and becoming independent of Great Britain in so far as steel is concerned.

• INTERNATIONAL MEETING—An international industrial conference will be held in Atlantic City in November. It is being sponsored by the United States Chamber of Commerce and the National Association of Manufacturers. Six delegates have been invited from each of the United Nations.

While the purpose of the meeting is to discuss such matters as imperial preferences, cartels and other trade problems, no resolutions will be adopted. The meeting is an effort to effect an exchange of business viewpoints stripped of diplomatic implications.

• SECONDARY WAREHOUSE—The Secondary Warehouses Association is holding rapid fire meetings this week at Detroit, Cleveland and Chicago to acquaint its members with the operation of the new zone price plan. The meetings are to be conducted by J. Paul Hellstrom, OPA expert, who has agreed to the association's request for such instruction.

The Oron Age



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
June 22 June 29	94.0 91.5	101.0 99.5	97.5 98.0	98.5 98.5	94.5 94.5	106.5 104.5	98.0 98.0	97.0 97.0	99.0 99.0	95.0 86.5	94.0 86.0	99.0 99.0	78.5 91.5	97.5 96.0



on the Modern Plate Mill

Twenty-four hour operation of the Modern Plate Mill leaves no time for shutdowns to lubricate—or to repair the failure to lubricate. A modern centralized system of lubrication is indispensable to production.

Proper lubrication of your older Mills is even more essential and will show greater earnings.

On one 3-Hi Plate Mill, for example, savings of \$15,000.00 per month were made by the reduced rejections resulting from better lubrication. Life of top brasses was increased by more than 25 times, giving an additional saving of \$15,000.00 per year.

By eliminating the shutdowns formerly required to lubricate another large Plate Mill by hand, Farval has helped to increase output by 375 tons per day.

Power savings are reflected in a reduction of amperage load of approximately 10%, while at the same time overall lubricating costs were reduced 15%.

Bring your present equipment up-to-date. Install a Farval Centralized System and you will be able to better compete in the postwar market.

The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.



A Study of the Smaller War Plants Pool

Washington

• • • The outbreak of war found many small manufacturers confronted with almost insurmountable problems, due to their inability to accept war contracts as individual plants. The fact that most civilian type items were drastically curtailed only added to the difficulties.

It did not take long for many of these small producers to realize that by pooling their resources they would be able to seek war business. Since the beginning of the rearmament program, hundreds of pools, consisting of groups of far-sighted small business concerns, have been formed throughout the country to engage in the production of articles for war and essention civilian needs. A large number of these never requested government approval and certification for the reason that they served exclusively as subcontractors. However, 231 pools have received government approval and certification, first as Defense Production Associations, and later as War Production Associations.

A recent survey shows that 151 pools are still in existence. An analysis of the replies to the survey indicates that the 151 pools have approximately 2400 members with 130,000 employees and that up until July 15, 1943, they had taken contracts valued at more than \$300,000,000.

Since Maury Maverick has taken over at the Smaller War Plants Corp., steps have been taken to convert from a passive to an active pooling program looking to the stimulating of pooling in appropriate cases and the instituting of a program to encourage a more widespread use of the facilities of pools in both war and essential civilian production.

SWPC is given authority in Public Law 603 to aid in the formation of War Production Associations and pools. The organization of a pool is different from the ordinary prime subcontractor relationship and is distinguished from it for the following reasons: In a war production association, there must be a predetermined agreement or understanding between the members for their joint participation in the performance of contracts, whereas in the ordinary prime and subcontractor relationship, a predetermined agreement or understanding is not necessary, and the prime conBy EUGENE HARDY

Washington Staff

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tractor is entirely free to select his subcontractors, determine the amount of work each one shall perform and the price he shall be paid for his work. Also, when negotiating for contracts, a war production association does so on the basis of the combined facilities and capacity of its members, whereas the prime contractor conducts his negotiations on the basis of his own facilities and capacity, and if he does not possess all the facilities necessary for the suc-

- • The success of some of the pools is emphasized by this typical comment from the Charlotte War Products Pool, Charlotte, N. C.: "Our success is attributed to the organization of the pool. Our members feel that pooling is a salvation to most of the companies. . "
- • The failure of other pools is summed up by the comment of J. G. Braun, War Production Association, New York: "There is considerable antagonism toward pools on the part of government contracting agencies. If this antagonism could be laid aside, we feel sure that they would play a far more valuable role in the war effort."

cessful execution of the contract, his acceptability as contractor to procurement agencies is wholly dependent upon his own established reputation.

To insure against prosecution of such pools under Federal antitrust laws Congress has provided a procedure in Public Law 603, whereby war production associations, upon certification by the chairman of WPB to the Attorney General, are exempt from prosecution or civil action under the antitrust laws or the FTC act, provided their activities are confined within the limits of the plan of organization and procedure, which has been approved.

The success of some of the pools is emphasized in the following comments received by SPWC.

Adirondack Manufacturers' Pool, Hudson Falls, N. Y., reported: "The Sandy Hill Iron & Brass Works (pool principal) has employed as many as

52 of the outlying small manufacturers. We cushioned the unemployment caused by the shutdown of paper mills at Ft. Edward and at the Union Bag & Paper Corp., Hudson Falls. We have spread some \$2,000,000 over these smaller concerns. In my opinion, the carrying on of this pool would be the only way in which these smaller plants could be taken care of."

Charlotte War Products Pool, Charlotte, N. C., announced: "Our success is attributed entirely to the organization of the pool. At the time of organization, we had among the machine shops in the neighborhood of possibly \$25,000 in war work. This figure has increased steadily to where we maintain a backlog of orders amounting to \$2,000,000. Our members feel that pooling is a salvation to most of the companies participating and that the continuation of the pool after the war in some form will probably be beneficial."

SWPC files hold many letters of this nature. Not all pools were successful, however, and SWPC officials point out five general reasons for their failure.

1-Once the pool was formed, there was no one employed or designated by the pool who actively and consistently tried to obtain orders for the pool. 2-Many pools were composed of such ill-assorted facilities that they could not function. 3-Pools did not receive the necessary instructions or aid from government agencies to enable them to continue successfully. 4-Some pools were composed of such inefficient companies that they could not meet the required prices or tolerances. After some pools were formed, the individual members found such a demand for their particular type of facilities that they were able to operate successfully alone.

The following comments are typical of those received from unsuccessful and dissolved pools:

J. G. Braun, War Production Association, New York. "There is considerable antagonism toward pools on the part of government contracting agencies. If this antagonism toward pools could be laid aside, we feel sure that they would play a far more valuable role in the war effort."

Associated War Contractors, Inc.,

Oakland, Cal. "Pool unsuccessful because of lack of enthusiasm on part of government contracting agencies."

In order to broaden the work opportunity and remove the restrictions imposed by limited capacity and lack of all necessary facilities, in appropriate circumstances, small business concerns could be organized into production associations, where their facilities and skills complement each other. In doing so the small manufacturers are not limited to bits and pieces, but can produce whole units or complicated subassemblies. They can also maintain the constant sales effort required to acquire business, which the individual small business concerns cannot afford, and through cooperative action, they can acquire technical, managerial, and financial assistance that is not available to them individually. All of this can be done under a pooling arrangement, without the necessity of having it done by the government, as have been proposed. Small business, in general, is more able to cooperate in such a program now than previously because in the past two years they have acquired new skills and are generally capable of higher grade machining.

During the period of reconversion, pooling of small business concerns might be of inestimable value, according to SWPA, since it would enable them to participate in certain opportunities that will be available to business and will allow them to gradually convert to normal peacetime operation, without going through a period of limited production, entailing operating losses and an impairment of their operating capital.

Warehouses which were formerly limited to purchases from mills of base tonnages of regular products, found shortly after the first of the year that this restriction had been lifted on all products except three, namely, sheet, plate and mechanical tubing which were held to 150 per cent of base tonnage.

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Soon after it became evident that the purchasing authority accruing from the sale of surplus steel through a warehouse could be utilized to buy mill steel to the limit of accrued authority for any product desired and up to 150 per cent on the three limited items.

The effect has been, it is reported, that purchasing has centralized a maximum amount of purchasing authority on the scarce items up to the full 150 per cent limit even though the original purchasing permission did not originate from sales of these products. Thus every warehouse dealing extensively in surplus steel could and did apply the added purchasing authority to buying the scarce items to the limit plus full replacement of all other products. This is said to have had the effect of pyramiding the shortage of the scarce items and actually causing an artificial shortage. This is true at least on mill order books as much of the authority was projected to replacement of sheet, plate and mechanical tubing for as much as two quarters ahead. This filled mill order books and left no room for the unwary warehouse which did not resort to this practice.

Lifted CMP Rules Crowd Warehouses

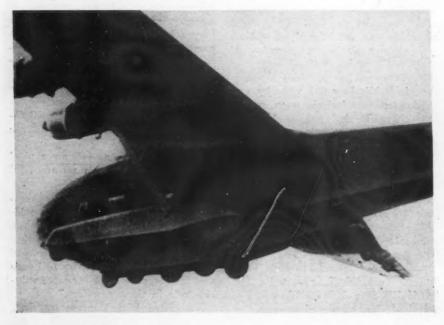
Cleveland

• • • • Abuse of certain lifted CMP restriction on warehouse purchases of steel for stock appears to be partially responsible for the crowded conditions of warehouse mill load directives and partly responsible for the poor delivery from mills which is lowering some warehouse steel stocks in this area, according to warehouse authorities.

The sudden upshot in steel demand, all of which has not been possible for the mills to absorb, has caused a brisk

upswing in warehouse steel sales. The benefits of this move have been neutralized somewhat by poor deliveries of mill steel to some warehouses. A cause for it is seen in the relaxations of CMP limitations on warehouse purchasing authorities which have caused certain warehouses to overload the mills as far ahead as the fourth and first quarters. This in turn appears to have resulted from the anxiety of both government and industry to move excess steel.

NAZI CARGO PLANE: A huge, six motored, ten-wheeled Nazi cargo plane en route with reinforcements to the German troops on the Russian front. Photograph was taken from a captured German newsreel prior to recent setbacks of the Nazis in Russia.



Steel's War Record Seen In Recent Institute Booklet

New York

• • • New records for total steel production were established four years in succession, 1940-1943, as the American steel industry worked to arm the nation for war, it is stated in a booklet, "Steel's War Record," just issued by the American Iron and Steel Institute.

The booklet presents in considerable detail the wartime achievements of the industry in expanding capacity and production, developing new products and solving emergency problems. It is illustrated with charts and contains a statistical summary of wartime steel production.

Copies are available without charge from the institute at 350 Fifth Avenue, New York 1.

Army Air Forces Simplify Rules On Off-Tolerance Material Acceptance

Dayton, Ohio

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• • • The Army Air Forces Material Command has announced a program designed to simplify procedure covering acceptance of articles manufactured for the AAF which do not exactly comply with specifications but which are substantially sound in quality.

Col. B. L. Boatner, chief of the Materiel Command Inspection Division, said the new policy is necessary in order to conserve both materials and manpower and to avoid delay in the production and delivery of supplies. In the past, he said, such acceptance has been controlled by the somewhat cumbersome and elaborate "Salvage Board" procedure, time-consuming for contractors and AAF inspectors alike, who were sometimes unable to keep abreast of the flow of articles demanding attention.

The AAF will accept marginal articles in which, in its judgment, variation from specifications does not adversely affect safety, performance, durability, weight, or interchangeability.

Under the new system, there are two principal innovations. Certain contractor's inspectors will be authorized to use special, standardized limits, to be known as "Materials Review Limits," which are to be developed for each kind of article. Members of groups which will administer these limits will be permitted to operate independently without convening in formal sessions. These groups will be known as "Materials Review Boards."

The new Materials Review Limits are for inspection purposes only, and under no circumstances will be used for production purposes. They are not to be confused with engineering tolerances, which remain unchanged and unrelaxed. Materials Review Limits will be established by each prime contractor, and approved by the local Materials Review Board, which will consist of representatives of the contractor's inspection and engineering departments and inspectors of the procurement agency. Thus each contractor's Materials Review Limits will be based on local experience.

Once developed and standardized, Materials Review Limits will be transmitted to all licensee plants producing the same article, and such plants will not use other limits. However, with the concurrence of the AAF

Materiel Command, the prime contractor may delegate to a particular licensee plant the responsibility for establishing and maintaining these limits.

The primary duty of the Materials Review Boards will be the local formulation of Materials Review Limits, rather than the detailed consideration of each out-of-tolerance item. They will also be responsible for the general administration of Materials Re-

view procedure. When articles are outside of Materials Review Limits, or when articles contain defects not covered by established Materials Review Limits, such articles will go to the board for disposition, and may be either accepted, reworked, or scrapped.

Operating under the pressure of stepped-up aerial warfare and the need for expediting the movement of equipment to the theaters of operation, the Materiel Command believes that its new policy will be of material assistance. Col. Boatner emphasized in his statement, however, that there will be no lowering of AAF production standards.

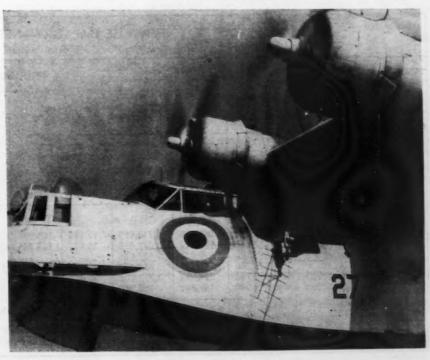
AAF Materiel Command Starts Survey to Determine Manpower

Wright Field, Ohio

• • • The AAF Materiel Command has launched a survey to determine manpower *requirements and work schedules for all of its installations throughout the nation, it was announced at headquarters recently.

The survey will cover each of the some 30,000 Materiel Command civilian employees and all military personnel. It will be exhaustive and wide in scope. The plan has been termed by manpower officials in Washington an excellent example of simplicity and practicability, combined with thoroughness. The survey will give Materiel Command officials current knowledge of the work load encountered by all divisions, sections, districts and areas, together with comparative figures on the number of personnel used and required in similar types of work. All groups of employees will be offered an opportunity to make suggestions for increasing their effectiveness.

ON THE BEAM: A French pilot of a U. S. built "Catalina" flying boat gets landing instructions in his own language from a countryman on duty in the control tower somewhere on the Mediterranean, near Gibraltar.



Shipbuilders Take More Than One-Fifth of Steel Shipments in 1st Quar.

New York

• • • Shipbuilders received more than one-fifth of the total tonnage of steel products shipped to consuming industries in the first quarter of 1944, according to a report released by the American Iron and Steel Institute covering shipments of 15,539,000 tons of steel by companies producing more than 95 per cent of the total output of finished products.

Nearly 3,221,000 tons of steel, or 20.7 per cent of total steel shipments, went to the shipbuilding industry in the first quarter. Both in tons and in per cent of total, shipbuilding's share of steel shipments exceeded 1943, when 11,509,000 tons, 19.3 per cent of the total, went to shipyards.

Ranking second among steel consuming outlets in the first quarter was the so-called "miscellaneous industries and export" group, in which are included, for security reasons, the tonnages going into such war uses as ordnance, projectiles and tanks. Total first quarter shipments to that group was 3,032,000 tons, 19.5 per cent of the total. During 1943, about 23.7 per cent of total shipments went to "miscellaneous industries and export."

The construction industry continued to take a smaller proportion of total shipments. About 1,048,000 tons of steel, 6.7 per cent of the total, went to that industry in the first quarter as against 7.5 per cent during 1943.

Railroads, however, received substantially more in the first quarter. Over 1,482,000 tons, 9.5 per cent of the total, were shipped to railroads and car and locomotive builders in that quarter as against 7.6 per cent in 1943.

Similarly, the agricultural industry received more steel in the first quarter of this year than in 1943. Almost 280,000 tons, 1.8 per cent of the total, went to the agricultural industry in the first quarter as against a quarterly average of 178,000 tons, 1.2 per cent of the total, in 1943.

Shipments to other industry groups in the first quarter of 1944 were: Steel converting and processing industries, 1,441,000 tons or 9.3 per cent of the total; jobbers, dealers and distributors, 1,849,000 tons or 11.9 per cent; pressing, forming and stamping industry, 721,000 tons or 4.6 per cent; container industry, 894,000 tons or 5.7 per cent; machinery and tools, 598,000 tons or 3.8 per cent; automotive and aircraft, 582,000 tons or 3.7 per cent; oil, gas and mining, 391,000 tons or 2.5 per cent.

SHIPMENTS OF STEEL PRODUCTS BY CONSUMING INDUSTRIES	Net Tons
Source: American Iron and Steel Institute	st Quarter 1944
1-Steel Converting and Processing Industries	
(a) Wire drawers and wire product mfrs	163,238
(b) Bolt, nut and rivet manufacturers (c) Forging manufacturers	297,716
(1) Automotive and Aircraft	166,120
(2) All other	427,447
(d) All other steel plants and foundries	386,876
Total	1,441,397

ymic easing tilk y	Net Tons 1st Quarter 1944
2-Jobbers, Dealers and Distributors	
(a) Oil and natural gas industry	114,437
(b) All other	1,734,295
Total	1,848,732
3—Construction Industry	
(a) Public (Municipal, State, National)	16,710
(b) Highways	35,342
(c) Railways	17,391
(d) Automotive and Aircraft	37,805
(e) Utilities(f) Bldg, trim, accessories and builders	49,932
(f) Bldg. trim, accessories and builders	00.000
hardware	98,883
(g) All other	791,600
Total	1,047,663
4—Shipbuilding Industry.	3,220,901
5-Pressing, Forming and Stamping Industry	
(a) Metal furniture and office equipment.	28 100
(b) Hardware and household equipment.	3 0 ,100 80,343
(c) Automotive	339,679
(d) All other	
Total	
rotar	721,437
6—Container Industry	100 220
(a) Oil and natural gas industry	129,558
(b) All other	764,602
Total	894,160
7—Agricultural, including Implement an Equipment Manufacturers	d . 279,561
8-Machinery and Tools	
(a) Machinery and tools, not including	
electric equipment	412,905
(b) Electrical machinery and equipment.	. 184,595
Total	597,500
9—Automotive and Aircraft Industry	. 582,054
10—Railroad Industry	
(a) All railroads	1,013,039
(a) All railroads (b) Car and loco. builders and parts mfr	s. 469,163
Total	1,482,202
11-Oil, Natural Gas and Mining Industry	
(a) Oil and natural gas, incl. pipe line	es 338,263
(b) Mining, quarrying and lumbering	53,074
Total	391,337
12-Miscellaneous Industries and Export	3,032,040

Total (Items 1 to 12)..... 15,538,984

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MAY BLAST FURNACE CAPACITY-NET TONS

Source: American Iron and Steel Institute

		PRODUCTION									
		Pig Iron		Ferro Manganese and Spiegel		Total					
	Annual							Per Cent	of Capacity		
	Blast Furnace Capacity	May, 1944	Year to Date	May, 1944	Year to Date	May, 1944	Year to Date	May, 1944	Year to Date		
DISTRIBUTION BY DISTRICTS:											
EasternPittsburgh-Youngstown.	12,815,680 26,852,460	942,380 2,187,172	4,713,510 10,677,839	17,114 15,814	103,927 106,785	959,494 2,202,986	4,817,437 10,784,624	88.4 96.8	90.5 96.7		
Cleveland-Detroit Chicago	6,620,500 13,575,540	529,042 1,119,337	2,657,576 5,611,434		8,780	529,042 1,119,337	2,657,576 5,620,214	94.3	96.6 99.6		
Southern	4,822,790 2,372,900	374,743 147,362	1,772,465 704,379	9,902	68,298	384,645 147,362	1,840,763 704,379	94.1 73.3	96.7 71.5		
Total	67,059,870	5,300,036	26,137,203	42,830	287,790	5,342,866	26,424,993	94.0	95.2		

During 1943 the companies included above represented 99.5 per cent of the total blast furnace production.

Steel Companies Conclude Direct Testimony Before "Basic Steel" Panel

Washington

et Tons Quarter 1944

114,437

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16,710 35,342 17,391 37,805 49,932

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30,100 80,343 339,679

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29,558 764,602

394,160

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82,054

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82,202

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32,040

8,984

• • • Steel companies concluded their direct testimony before the WLB "basic Steel" panel in the CIO-USWA case on June 23, and rebuttal evidence by the union will be presented on July 5, 6 and 7.

The steel companies have not indicated whether they will submit surrebuttal evidence. Arguments before the board likely will take place the latter part of September. The decision, by coincidence or otherwise, could thus be expected to be handed down as a pre-election contribution to a zestful campaign. This suggestion occurs because it was on the eve of the Nov. 8, 1938 Congressional elections that the Walsh-Healey Public Contracts Board handed down its decision granting steel wage increases by readjusting the geographical wage areas.

The hearing in the ore case began on Tuesday of the present week in Duluth, Minn., and will be concluded on Friday. Independent and labor members of the panel hearing this proceeding are the same as those serving on the "basic steel" panel while the industry members are R. C. Allen, Cleveland, of Oglebay, Norton & Co., and Thomas M. McCabe of Duluth. No date has been set for hearings before the miscellaneous panel before which foundry interests, among others, will make their presentation. It is the plan to hand down findings simultaneously in the ore and steel cases. Findings in the miscellaneous case will be made independently of the ore and steel cases.

The closing day of the steel industry's testimony brought a concrete plan for preventing work stoppages, presented by W. H. Harvey, Jones & Laughlin Steel Corp. representative. The plan proposes establishment of a permanent salaried arbitrator who would be empowered to enforce the contract with USWA by the imposition of penalties or sanctions upon the corporation, the union or the employees found by the arbitrator to be responsible for strikes or stoppages of work. The arbitrator's decision would be final.

The proposal for sanctions against strikes as a part of the J&L contract was supported by Mr. Harvey with the suggestion that (1) the union should recognize it has an obligation for continued uninterrupted operations and enforcement of the con-

tract; (2) that all strikes and lockouts are violations of the contract and (3) that any violations of the contract by employees, the union or the corporation should be referred to the arbitrator whose salary and expenses would be paid jointly by the union and the corporation.

It was proposed by Mr. Harvey that the arbitrator would fix the responsibility for any work stoppage and apply sanctions against offenders by declaring that any employee participating in a strike shall be considered as having voluntarily quit his employment. Employees found by the arbitrator to be "not guilty" would be reinstated without prejudice. Those employees who are found to be responsible for the strike would be penalized by any one or combination of the following: a reprimand; placement on probation; a fine of \$5 or less for each day of offense; removal of vacation allowance at a rate not to exceed loss of one day's vacation for each day of offense; loss of seniority at a rate not to exceed loss of one year's seniority for each day of offense; or suspension from work at rate not to exceed two weeks for each day of offense; or by discharge.

As a sanction against a lock-out by the company, the arbitrator may order that the employees be reimbursed for their wages lost while locked out.

In addition to the J&L demand for the inclusion of strike deterrents, the corporation asked for provisions which would stabilize the wage structure by a "constructive program which shall be developed to insure the eventual equity of rate alignment within each plant as an entity, without increasing the then existing total wage bill at the concerned plant." The corporation also demanded the elimination of maintenance of membership and check-off provisions of the contract on the ground that because of the 145 work stoppages since the signing of the contract the union does not fall within the scope of deserving such privileges.

J. M. Larkin, vice-president of the Bethlehem Steel Co., told the panel that \$120,000,000 would be added to Bethlehem's annual employment costs if the 17c. an hour demand were granted.

A guaranteed annual wage for the approximately 300,000 men on the Bethlehem payroll at the end of 1943 would mean employment costs of

\$727,000,000, Mr. Larkin stated, figuring their pay at 40 hr. per week, and at their average hourly straight time earnings. Assuming a postwar year equivalent to 1937, the best peacetime year in Bethlehem's history in respect to total receipts, this guaranteed payroll alone would be \$302,500,000 in excess of total receipts.

USWA's high-handed way of compelling a member of the union to become a permanent member against his will was revealed by the American Rolling Mill Co. Designed to nullify the escape clause provision of the board's maintenance of membership order, local and international offices of the union coolly refused letters which contained resignations of members who desired to withdraw from the union during the 15-day escape period. To support this charge Armco placed in the record photographic reproductions of registered letters which the union refused.

In order to block such resignations, it was charged, the union during that period refused to accept any registered mail, and thereafter claimed as members—and demanded a check-off of dues for—workers who had sought to resign. This action, it was urged, was so flagrant as to forfeit any right by the union to further maintenance of membership protection.

Todd Succeeds Block As WPB Steel Division Director

Washington

• • Effective June 21, J. L. Block has resigned as deputy director of the WPB Steel Division to return to his position as executive vice-president of the Inland Steel Co. Mr. Block, who came to WPB about two and one half years ago, served as assistant director in charge of production and as assistant director in charge of programs and distribution.

In announcing his resignation Norman W. Foy, WPB steel division director, said Mr. Block had made an outstanding contribution to the war effort, particularly in the organization and early direction of the work of the Division's Production Directive Committee.

Mr. Block has been succeeded as deputy director by William B. Todd, who has been serving since April as assistant deputy director. Prior to that time Mr. Todd served as the division's representative on the Harriman Mission in London. Mr. Todd has been associated with the steel industry for more than 40 years both in operating and sales capacities.

War Material Made by Steel Companies

- Products of Fabricators not included -

(Courtesy of American Iron and Steel Institute)

Airport Mooring Eyes Airport Sweeper Parts Ammunition Igloos Antenna Masts

Armor, Forged and Rolled

Aircraft Naval Tank

Aviation Equipment

Airborne Radio Chassis Airborne Shovels Bomb Bay Doors Bomb Racks Bomber Wing Parts Control Cables Engine Cowling Engine Cylinders Engine Filters **Engine Mounts** Engine Piston Pin Plugs Fuselages Instrument Panels **Jettison Tanks** Landing Gear **Propeller Blade Sections** Propeller Domes Side Panels, Training Planes Stabilizers **Turret Parts** Wing Flaps Barbed Wire Concertinas Barbed Wire Entanglement Posts Blackout Lamp Brackets Blitz Cans

Bombs

Armor Piercing
Chemical
Demolition
Depth
Fragmentation
Incendiary
Semi-Armor Piercing

Buildings, Prefabricated

Barracks
Bomb Shelters
Canteens
Chapels
Decontamination Stations
Field Hospitals
Hangars
Parachute Lofts
Quonset Huts
Sick Bays
Surgeries
Task Force Buildings





Bridges, Portable
Buoys
Camouflage Netting and Stakes
Canteens
Catapult Forgings
Cooking Equipment, Portable
Debris Rafts
Depth Charge Booster Cans
Electronic Listening Device Frames
Fire Control Instrument Stator
Shells
Fresh Water Condensers, Portable
Hospital Equipment, Portable

Guns (see Ordnance)

Invasion Pipe Line

Landing Craft

Landing Craft

LST Landing Ship, Tank

LCI (L) Landing Craft, Infantry (Large)

LCVP Landing Craft, Vehicle, Personnel

LCM Landing Craft, Mechanized

LCT Landing Craft, Tank

LCC Landing Craft, Control

Landing Mats, Aircraft

Life Raft Cylinders

Machetes

Military Vehicle Equipment Ammunition Wagon Frames

Half-track Mechanisms
Tank Parts
Armor
Axles
Body Forgings
Engine Parts
Seats
Track Guides, Pins and Bushings
Transmission Parts
Minesweeper Cable Cutters

Ordnance Equipment Ammunition, Small Arm

Ammunition Boxes
Belt Link and Cartridge Clips
Bullet Jackets
Cartridge Case Cups
Fuses
Bangalore Torpedoes

Guns and Parts

A-A Magazine Parts
A-A Gun Stands
Breech and Firing Mechanisms
Elevating Mechanisms
Fences
Foundations
Hitches

Liners
Loader Assemblies
Machine Gun Barrel Jackets
Machine Gun Feeds
Mounts
Naval Rifles
Pompom Cooling Couplings
Recoil Cylinders
Rifle Holders
Rifle Sights
Rocket Casings
Rocket Projector Tubes
Submachine Gun Magazines

Shel

Anti-aircraft Armor Piercing Burster Chemical High Capacity High Explosive Rocket Shell Packing Cases Trench Mortar Parachute Harness Hardware Periscope Tubes **Pontoons** Pot Shells Protection Plates Radio Towers Radar Bases Rebuilt Army Trucks

Ships-Merchant, Naval

Aircraft Carriers
Battleships
Cargo Vessels
Cruisers
Destroyer Escorts
Destroyers
Floating Drydocks
Floating Power Plants
Tankers

Ship Components

(produced by steel companies not operating shipyards) Anchors Barbettes Booms

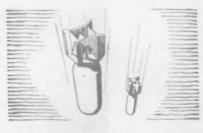
Bow Assemblies
Bridge Houses
Bulkheads
Casemates
Clock Barrels and Covers
Deck Brakes, Aircraft Carrier
Deck Houses
Decks
Engine Bods
Engine Frames





Furniture
Fenders
Grab Rails
Gratings
Hatches and Covers
Hulls, complete and in sections
Keels
King Posts

Life Raft Launching Devices Marine Hardware Masts **Pilot Houses** Rotors Rudders Ship Lockers Ship Struts Skegs Sky Lookouts Stacks Stern Assemblies Submarine Fittings Submarine Rings Torpedo Bulkheads Ventilators Watertight Doors Yardarms Smoke Candles



Submarine Net Stays
Tent Stoves
Torpedo Defense Nets
Torpedo Flaskheads
Torpedo Handling Frames
Torpedo Straps and Thimbles
Weather Shields

Institute Computes That Employees Get 10% of Sales Dollar

New York

• • • Forty cents out of every dollar received by steel companies during 1943 from the sale of their products were distributed in payrolls to employees, increasing the employees' share of the industry's sales dollar ten per cent in a single year, the American Iron and Steel Institute has computed.

After meeting payrolls, taxes and all other expenses in 1943, the portion of the sales dollar available for dividends and to leave in the business was among the lowest for any year in which the industry did not actually go "into the red."

In 1942, steel company payrolls absorbed 36½c. of each sales dollar, one of the largest employees' shares on record up to that year.

Largely as a result of the substantial rise in payroll costs last year, the taxable income of the companies was reduced, with a corresponding reduction in federal income and profits taxes. Consequently, that part of the sales dollar required to meet tax bills dropped from 12½c. in 1942 to 9c. in 1943.

Meanwhile various other costs took out of steel companies 1943 sales dollar as much as or more than they called for in the preceding year. After meeting all such charges only 2½c. remained out of each dollar received last year, as against 3½c. in 1942.

Two cents of the 1943 remainder was paid out in dividends to stockholders, and half a cent was left in the business as a reserve against the future and to build up credit. In 1942,

dividends amounted to 2½c. per dollar of sales, and one cent was left in the business.

Compared with a typical recent peacetime year such as 1937, the sales dollar in 1943 showed nearly 10 per cent more going into payrolls and over 60 per cent more going for taxes. The share going to stockholders in 1943 was 60 per cent less than in 1937, and the amount left in the business was 80 per cent less. The portions going for other expenses were relatively stable between 1937 and 1943.

Gray Iron Foundry Society to Hold Management Conference

Cleveland

• • • Congressman Charles A. Halleck of Indiana, chairman, Republican Congressional Committee; William B. Murphy, WPB deputy vice-chairman for production, and Joseph D. Keenan, WPB vice-chairman for labor production, will be among the principal speakers at the Midwest foundry management conference of the Gray Iron Founders' Society to be held at the Stevens Hotel in Chicago, July 6, W. W. Rose, the association's executive vice-president, has announced.

"This meeting will discuss searchingly, from the viewpoints of management and the government agencies concerned, all factors seen to be responsible for the production-hampering situation with the aim of speedy, realistically approached solutions," according to Mr. Rose.

The acute problem of war-vital production created by the industry's desperate shortage of labor, and the steps taken by and under consideration in War Production Board and other government agencies in the effort to effect "relief now," will be outlined by Mr. Murphy in one of the key talks of the morning session. Mr. Keenan, a member of the new special task committee, will discuss the double edged problem from the viewpoint of the Office of Labor Production, and Mr. Cannon, a member of the gray iron foundry industry advisory committee of the War Production Board, will review the situation and examine government-sponsored remedies from the point of view of foundry management. The accounting viewpoint will be presented by Mr. Caldwell, until recently senior business specialist in the OPA.

In the afternoon session the problem will be viewed from the standpoint of the War Manpower Commission by Dean Spencer and the price control angle will be discussed by Mr. Welfling, who will be followed by Mr. Magrath, a member of the gray iron industry advisory committee of the Office of Price Administration, in an industry-view analysis of the price control situation.

Canadian Aircraft Output To Be Upped 10 Per Cent

Toronto

• • • Aircraft production in Canada will be increased by approximately 10 per cent in the current fiscal year to reach an alltime peak value, H. J. Carmichael, coordinator of production and chairman of the Production Board, announced. There will be a drastic reduction in output of all types of guns, including small arms, which may be as much as 25 per cent from last year, Mr. Carmichael stated. He further estimated that production of miscellaneous equipment will decline about 20 per cent.



Interest Aroused in England Over Steel House Postwar Possibilities

London

• • • Great interest has been created here by the development of the steel house as a contribution towards surmounting the postwar housing shortage.

The following report on steel housing was taken from the report in The Metal Bulletin, May 5.

In view of the fact that a number of steel houses have been giving satisfactory service since the last war.

The house is constructed of prefabricated units. The floors are in sections and are formed of sheet steel joists to which flooring is directly

screwed. The walls consist of panels into which are built steel windows. The panels are fixed on a sheet sill at floor level and between vertical corner and middle posts. There are three horizontal steel flats (namely, at top, bottom and center) in the thickness of the wall, and hv means of steel wedges at the ends of these flats the sections are tightened up. The low-pitched roof has pressed metal joints. Pressed steel is

also used, of course, in the prefabricated kitchen-bathroom unit, including cooker, sink, refrigerator, cupboards, bath, washing boiler and washing bowl.

Internally the construction is a masterpiece of pressed and rolled steel. Steel ceilings, pressed steel doors and cupboards, and a stainless steel threshold and chromium-plated

0 0 0

THE LIVINGROOM: Here is the livingroom of the British prefabricated house. The house is made almost entirely of steel and is fully insulated.

fittings provide attractiveness and convenience. The decorations are well chosen—cream and green.

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Externally the steel walls are finished with a creamy oil-bound paint, The roof, which is tarred, is invisibly supported on steel sheet ribs, stamped with holes for lightness, its section rather resembling an airplane wing.

The thickness of the pressed steel sheet varies somewhat but approximates 20 gage. The wooden floor is supported on pressed steel inverted U sections. The total weight of steel used is about 11,900 lb.

It is claimed that the pressed steel

house has advantages over the plain-walled types and that thinner steel can be used. Each of these emergency houses contains about 5 gross tons of steel. Lord Portal has stated that it will take about three months to work up to full production once the scheme is put in hand; this would represent about 2500 houses a week. Acalculation shows that the weekly consumption of steel will be 12,500 gross tons of pressed steel. In a year



year some 125,000 houses consuming 625,000 tons of steel could be built on this basis. If several hundred thousand of these dwellings are put up during the immediate post-war years they will provide quite a useful outlet for British steel, although the quantity involved will obviously not be adequate to solve all of the industry's marketing anxieties by a long way.

It is understood that the big steel rolling mills such as Richard Thomas, John Summers and Whitehead Iron and Steel Co., Ltd., are likely to benefit from the business. Firms engaged in the pressing of steel such as Pressed Steel Co., Ltd., Briggs Motor Bodies and Fisher and Ludlow, Ltd., should secure employment on the working-up side.

In some quarters of the steel trade the feeling is expressed that the industry might go still further and offer the country steel houses of a more permanent type. The engineering problems involved can be regarded as already surmounted and the problem would be mainly one of overcoming public prejudice. In our opinion, there is no reason why, with modern technique, most attractive steel houses could not be produced at a reasonable cost. We believe that Ministry of Works has not overlooked the possibility.

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We were favorably impressed by the emergency house and consider it to be a most promising attack on the post-war problem. The prototype is, we understand, hand-fabricated, but its mass construction should present no difficulties. Lord Portal deserves the nation's praise for his drive and energy.

In the House of Lords recently Lord Portal, who sponsored the scheme, stated in connection with the specimen steel house that he has been exhibiting that the insulation was made of aluminum foil. This type of heat insulation has been known as very efficient for a long time, and if widely used in the new housing programme would provide a valuable outlet for aluminum.

• • • "House Construction," a British publication on postwar building studies, includes a survey of more than 500 cast iron houses built according to the Thorncliffe system in 1927. These houses utilize about seven tons of cast iron equal to about 9500 bricks, and cost, in 1927, about \$65 more than brick houses with a comparable accommodation. As the cost of pig iron rose after 1927, cast iron houses became uneconomical to build.



THE KITCHEN: Here may be seen the kitchen of the steel house from the livingroom. Half a million of these steel houses are being planned by the British Ministry of Works. Entire house comprises a living-room, two bedrooms, a kitchen, bathroom and a shed.

With suitable equipment for handling the 200 lb. plates, four semiskilled men could erect the framework of two houses per week. However, if cast iron houses are to find a place in postwar housing, better thermal installation must be provided by the development of a suitable lining or other means, and the external finish of the house must be improved. These problems should not be too difficult for modern scientific achievement and developments in architecture. This, quite obviously, leaves the problem as one based on cost and speed of erection.

The report makes no mention of ancillary matters such as bathroom equipment, refrigeration, stoves, and other similar items in which the foundry industry has a preponderating interest.

Rulings on Government Owned Property Expected

• • • • SWPA will soon issue Regulation 2 providing that RFC handle all government real estate disposal and designating a new procedure for small agencies owning surplus material not covered under Regulation 1.

SWPA Administrator William L. Clayton will also announce soon special instructions for the handling of scrap by War Department contracting officers in approving sales of termination inventories. SWPA feels that many officers who have had no industrial experience might be reluctant to declare material scrap if it is undamaged and still usable for war production but not ordinary civilian production. In this category might fall many expensive jigs and dies, specially designed for military weapon production.

One of the biggest future deterrents to the average manufacturer contemplating the purchase of surplus metals, a SWPA spokesman said, is the fact that much of it will be in lots where sizes, shapes, chemistries and extras, are different. The average manufacturer is expected to be interested only in surplus material which is properly segregated and in most cases will undoubtedly prefer to buy new material from old suppliers from whom he is certain to get what he wants when he wants it. This means, the SWPA official said, that much good finished material will probably be sold as scrap.

President Roosevelt Reports to Senate on Surpluses

Washington

• • • Complying with a Senate Resolution passed in March, President Roosevelt on June 15 reported to that body on: (1) The value of surplus property disposed of by government agencies; (2) the value of property declared surplus and undisposed of including termination inventories, and (3) the status of agency property accounting, together with recommendations for remedying faults in government inventory records.

An accompanying table shows property disposed of by government agencies.

The President said that agencies have to currently dispose of the following amounts of property:

Pro	perty Value,
Agency	Dollars
War Department	298,000,000
Treasury Department	30,221,887
Reconstruction Fin. Corp.	90,000,000
Maritime Commission	16,000,000
Federal Economic Adm	20,856,978

Because there are wide variances between and within agencies in the methods of controlling property, it

PRESI	DENT ROC	SEVELT'S	REPORT	TO THE S	ENATE C	F PROPERTY
	DISPOSED	OF BY F	EDERAL A	AGENCIES	AS OF J	UNE 15
				- *** **		

(000's of Dollars Omitted)

				DESTINATION		
AGENCY	KIND OF PROPERTY	DISPOSAL PERIOD	VALUE Dollars	War Production, Dollars	Other Agencies, Dellars	
War	Personal and mixed Industrial	July, 1943 to April, 1944 July, 1943 to April, 1944 July, 1943 to April, 1944	260,000 82,000 60,000	122,000 62,000 60,000	39,000 (9,000 redistributed in War Department)	
Navy Treasury RFG Maritime	Four war plants Real estate All kinds. Personal (consumer) Personal (industrial) Personal (industrial)	July, 1943 to April, 1944 July, 1943 to April, 1945 July, 1942 to July, 1943 January to June, 1944 January to June, 1944 January to June, 1944	95,000 (cost) 15,000 (cost) 35,000 53,734 52,000 19,000	(Land leased	2,000 (15,000 redistributed	
FEA.	All kinds	January to June, 1944	6,459		to Maritime contract	

will be impossible to assemble within a reasonable period complete data concerning surpluses or the development of comprehensive totals of property owned by the Federal government, the President said.

Consequently, the President urged the passage of overall legislation con-

taining adequate standards, controls for procurement and utilization of property. The absence of such legislation results in "unauthorized augmentation of congressional appropriations by free and irrational transfers of cash equivalents from one agency to another," the President declared.

Little Prospect for Civilian Goods

Toronto

• • • J. Gerald Godsoe, chairman of Wartime Industries Control Board, speaking at the annual meeting of the Canadian Manufacturers Association here, stated that there is little prospect in the immediate future for the resumption of manufacture for civilian use of goods that can be deferred to another day. He said wartime controls will not be lifted in the near future, and some restrictions will have to be continued after the war to bridge the gap between war and peace. He further pointed out that there are certain to be increasing demands upon this country for raw materials, munitions and men for the armed services as the invasion of Europe is speeded up.

Steel sheets and strip are the tightest of the steel products, he said, and expansion of rolling mill capacity is expected to boost supply rate this year. Steel plate also is tight, especially in the Ontario market, and additional supplies are being sought from the United States. Tinplate is scarce

with production underway only in one Canadian mill and output cannot be increased without lowering production of armor and ship plate. On steel bars Canadian mill capacity is fully booked for 90 days into the future, with minor exception of some converting mills. Production of structural shapes has had to be reduced to provide steel necessary for the shell program and shape output now is limited to 3000 tons monthly. Wire nails and bolts are in good supply as a result of inventories built up earlier in the year.

Aluminum is in ample supply, he continued, and there is a surplus available for all war requirements and to take care of even the less essential domestic users and for export, but fabricating facilities are limited. Supply of copper is sufficient for essential requirements but in short supply for international trade. It is estimated that output of magnesium will total 5300 short tons in 1944 and there is no restriction on use in Canada. Production of nickel this

year should be over 100,000 tons, of which about 2250 tons will be used in Canada and the remainder for export. Tin remains on the critical list. Zinc supply is ample for all requirements with consumption currently running below that of 1943.

Contract Termination Is Result of Design Changes

Toronto

• • G. K. Shiels, deputy minister of munitions and supply, referring to Canadian war contracts stated that these may be terminated or ended simply because weapons good enough last week may be hopelessly outclassed today. He stated his department "did not regard termination of war contracts, disposal of surplus Crown assets and renegotiation of contracts as postwar problems because this is a war of change. The diabolical ingenuity of the Hun must not be underestimated. The thing to do is to scrap the obsolete weapon and get on with the making of the new and better one. This means termination of war contracts."



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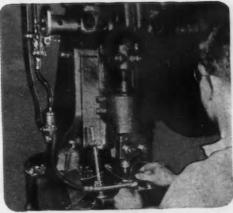
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Says Grant of USWA Demands May Mean the End of Underground Mining

Chicago

• • • Granting of wage demands of the United Steelworkers of America (CIO) upon Lake Superior iron ore operators might mean the end of underground mining in the district, Clarance B. Randall, vice president of Inland Steel Co., warned here on June 23.

A special panel of the War Labor Board is conducting hearings on June 27 in Duluth, Minn., on the case.

"No underground mine could long survive under such a load," Randall declared. "It might mean that one by one the Cuyuna, the Menominee, the Vermillion, the Gogebic, and the Marquette Ranges would be closed down successively—possibly in that order, and that only the open pits on the Mesaba would remain. I don't suggest, of course, that this would all come about overnight. It wouldn't be sudden death, but slow strangulation. For quite a while the mining towns would keep on hoping for a miracle that would never come.

"Why do I make these strong statements?

"Because I know the facts. I see mining costs from every type of operation and local people don't. I know that to mine one ton of underground ore costs five times as much as to mine one ton of open pit ore. And my personal friends in the mining towns in the north know that I wouldn't say that just to make a threat. My company wants to go on mining underground ore in those communities. But I should not be honest if I did not draw attention to the plain statement of facts that economic pressure will compel the eventual closing of underground mines if the cost of their operation increases and gets further out of balance in comparison with the open pits.

"Each new wage demand that adds one cent per ton to cost on the Mesaba Range adds five cents per ton to cost on the Cuyuna, the Menominee, and all of the other underground ranges. Steel companies obviously could not keep underground mines open just to support mining towns. They have to balance their own budgets, and they must get the ore where they can get it cheapest. With each new demand, the poor mines get poorer and the rich mines get richer.

"Unfortunately, it is the poor mines, the marginal, the underground mines that give the employment. Open pit mining does not employ much labor. Underground mining does. If the CIO destroys underground mining through a shortsighted policy of demanding more than the wage traffic will bear, it will destroy the prosperity of all mining towns in the Lake Superior district, outside of the open pits on the Mesaba Range."

Tripartite Panel Hears Union Demand

Washington

• • • The WLB has appointed a tripartite panel to hear the CIO-USWA demands on 19 companies operating approximately 40 iron ore mines in the Lake Superior region. The public and labor members of the panel will be those on the so-called "basic steel" panel: David L. Cole, chairman, and Nathan P. Feinsinger, vice-chairman, representing the public; John Despal, San Francisco, and Stephen Levitzky, Pittsburgh, inter-

national representatives of the union, representing the union. The industry members will be Thomas M. McCabe, Duluth, an attorney, and R. C. Allen, Cleveland, vice-president of Oglebay, Norton & Co.

The ore panel began hearings on June 27 in Duluth.

Meanwhile, the Basic Steel Panel, now in recess, will resume hearings during the week of June 20, with testimony of individual companies. This will leave only four hearing days for presentation of such evidence before the ore hearings are begun.

Hearings for the steel castings companies, which had been set for this week before the "Basic steel" panel, were cancelled and will be held at an undetermined date. Indications are that castings makers will be heard by the "miscellaneous" panel, whose personnel has not been named.

USWA rebuttal in the steel and ore cases has been scheduled for July 5, 6 and 7. The companies will be given opportunity to present surrebuttal testimony.

The ore panel, according to WLB, will endeavor to make its report to the board at the same time the "basic steel" panel makes its report. The report will be followed by arguments before the board, bringing the presentations of the cases to an end preliminary to a decision.

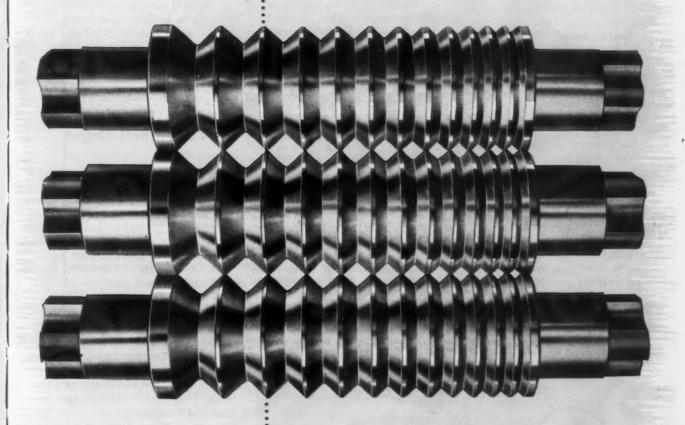
When the evidence will be concluded is only speculative but it will require a number of weeks yet. The time of the decision is even more speculative.

NAZI "BEETLES": Navy men study a Nazi "beetle" or miniature tank on a battlefield near the Anzio beachhead. These robot vehicles are sent forward against the Allied lines with a mechanism which allows them to be exploded at a distance.



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CHICAGO . PITTSBURGH

WLB Rules That No Man Must Join a Union to Hold His Job

Chicago

• • • Though reaffirming the proportionate union maintenance provision previously ordered in the contract dispute of Inland Steel Co. and three other operators of Great Lakes ore vessels with the National Maritime Union, the War Labor Board in its final directive received June 22 by Inland specifically sets forth that no man will have to join the union to hold his job.

The board denies "feather bed" working rule demands of the union calling for penalty payments for work at certain times and for work outside job definitions, maintaining previously ordered \$5 per month payments per man in lieu of these demands. The company's 10 per cent bonus plan providing for payment to men who join their ships before Aug. 1 and serve through the balance of the lake season was approved without change. The companies were ordered to pay overtime at the rate of 95c. per hr. for work in excess of eight hours per day.

In March, 1943, the board ordered that a definite proportion of union members to non-union men be maintained on company vessels. This plan

was a substitute for maintenance of membership on shore. The proportion existing on Aug. 1, 1943, must now be maintained for the 1944 season.

Inland in recent hearings had attacked the union demands for "feather bed" rules, charging that such rules would require double payments for maintenance work simply because it is performed at night. Approval of job definitions would have limited the scope of the work of the crew and would have required double payments for the performance of much of their normal work.

May Consumption of Lake Ores Totals 7,557,762 Tons

Cleveland

• • • Consumption of Lake Superior iron ore by furnaces in the United States and Canada during May totaled 7,557,762 gross tons, as compared with 7,272,566 tons for April and 7,373,972 tons for May last year, according to the Lake Superior Iron Ore Association. U. S. consumption alone for May was 7,329,961 gross tons, 7,051,576 tons for April and 7,168,788

tons for May, 1943, while Canadian consumption for the same periods was 227,801 gross tons, 220,990 and 205,184, respectively.

Cumulative total for the year to date is 36,096,977 gross tons for U. S. furnaces and 1,081,193 tons for Canadian furnaces as compared with the previous year's 36,124,295 tons for U. S. and 1,028,427 tons for Canada respectively.

Ore stocked at furnaces for both U. S. and Canada totaled 18,356,322 gross tons on June 1, 1944, as against 14,984,974 tons a month ago and 18,519,929 tons on the same date a year ago. Ore at Lake Erie docks (U. S. only) amounted to 3,117,297 gross tons on June 1 compared to 2,906,827 gross tons on May 1 and 2,777,169 gross tons on June 1, 1943.

Cleveland-Cliffs Buys 1944 Steep Rock Output

Cleveland

• • • Purchase of the entire 1944 iron ore output of the Canadian Steep Rock Iron Mines, Inc. was announced last week by the Cleveland-Cliffs Iron Co. The output of the mine which is expected to start producing this year is estimated at about 500,000 tons in 1944. A schedule of 1,000,000 tons in 1945 and at least 2,000,000 per year after that is contemplated. Cleveland-Cliffs has also arranged to purchase part of the output of succeeding years.

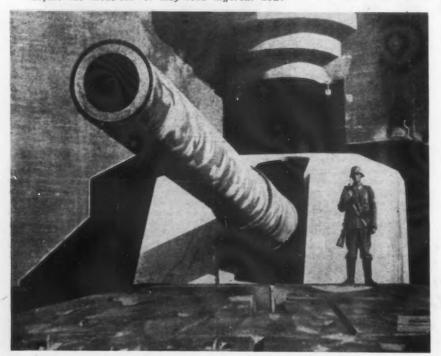
Steep Rock ore assays a particularly rich iron content with low phos and silica and is expected to be widely required for open hearth use as a premium lump ore. The contract was arranged through the agency of Premium Iron Ores, Ltd., sales agency for the Steep Rock Co.

Addams Heads Boiler Group

• • • The Steel Heating Boiler Institute reported that Homer Addams was re-elected president of the Institute at the annual meeting held at Hershey, Pa., recently. Mr. Addams is president of Fitzgibbons Boiler Co., Inc., New York.

R. B. Dickson, president of Kewanee Boiler Corp., Kewanee, Ill., was elected vice-president; W. J. Parker, secretary-treasurer and Montie L. Heminway, executive secretary, were reelected. J. E. Axeman, general sales manager of Spencer Heater Division, Williamsport, Pa., was made a member of the executive committee.

SCHNOZZOLA: The nose of a Nazi long range gun pokes out somewhere along the French invasion coast. Note how small the German guard appears along-side the piece. The picture was taken from the German magazine SIGNAL before the invasion. It may look different now.



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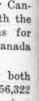
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Denver Resumes Shipbuilding Activity By Taking Large Contracts for LCT's

Denver

• • • This land locked Rocky Mountain industrial capital, whose big scale shipbuilding activity appeared to be sunk with the submarine menace, has staged a full fledged comeback in marine construction activity with the landing craft and pontoon programs.

Denver firms had fabricated 39 destroyer escort vessels for assembly at the Mare Island, Cal., Navy Yard before victory over the submarine caused this program to be cut off. Most of the firms participating in the destroyer escort construction, plus some additional companies, have thrown their energies into the building of LCT-6's with fervor.

As with the destroyer escort vessels, each contractor is assigned by the Navy to construct a certain unit of the vessel or to undertake a certain function for the entire vessel, such as steamfitting, electrical work, or painting, pickling and handling of material.

The units are designed in such a way that each constitutes a carload for railroad shipment. Although in the destroyer escort program most of the contractors were charged with procuring their own material, the Navy has elected to handle nearly all material purchasing for the LCT work

in order to simplify and coordinate material flow.

This coordinated effort does not represent a pool in the sense that a parent unit signs a master contract and then issues subcontracts to the balance of the group. In the Denver setup each firm makes its own contract with the Navy.

Among those working on the LCT-6 program are the Midwest Steel & Iron Works Co., Denver Steel & Iron Works Co., E. Burkhardt & Sons, Eaton Metal Products Corp., Thompson Pipe

& Supply Co., Hardesty Division of Armco Drainage & Metal Products, Inc., Ajax Iron Works, Silver Engineering Co., and Winter-Weiss. Howry-Berg, peace time automobile dealers, produce certain parts, but not complete units. Sturgeon Electric Co. handles the electrical work and Mc-Carty-Johnson, fittings for the vessels. Weicker Transfer & Storage does not fabricate, but is responsible for handling, painting and pickling the materials and units.

From the start, Denver has been a seat of activity on Navy pontoon production, with such firms as Eaton participating heavily. These pontoons, tied together as "rhino ferries," were important factors in the European invasion.

Navy Develops Rust Preventative

Washington

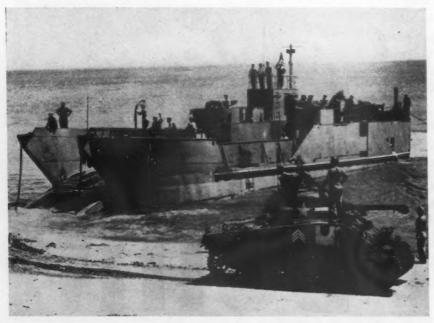
• • The use of a "thin film" rust preventive treatment and other counter corrosion measures—developed by the Bureau of Ships and the Bureau of Aeronautics, Navy Department, in conjunction with industry—have played their part in the assault on the beaches of France and elsewhere.

In order to have landing craft ready for maximum performance when the Task Force Commander gives the "go ahead" signal, their engines and vital moving parts must be in top condition. To insure this, they are protected by applications of the new compound against damaging corrosion and deterioration, which might result during construction and long ocean voyages and from local climatic conditions in fighting fronts.

The uses of the compounds are numerous. Officials of the Bureau of Ships say that these "thin film" treatments have a remarkable ability to displace water from metal surfaces, preventing corrosion, and, if used judiciously, do not have to be removed from the treated surfaces of engines and moving parts before the craft are placed into service. The preparations have been used extensively for reconditioning machinery which has been submerged in sea water.

When vessels are placed in inactive service—especially when it is desirable to have them quickly ready for sea again—these "thin film" compounds are valuable for preserving ship machinery and other metal equipment against corrosion and deterioration. The new method eliminates the time consuming process of removing "thick" coatings of ordinary grease, which was formerly used on vessels in a reserve or decommissioned status.

TANK LIGHTER: The latest model of the Navy's new LCT-6 beaches somewhere in the Pacific theatre to do its job. The large tank lighter has already dropped its ramp preparatory to taking aboard a 32-ton Army tank.



Ohio to Hire Through USES

• • • E. L. Keenan, Ohio director for the War Manpower Commission, is reported to be asking all Ohio employers to hire male workers only through the USES in accordance with the new War Manpower Plan, instead of waiting until July 1 when the new Referral Hiring Plan is expected to be formally enforced.

More Parts Per Broach WORK POSITION L WORK POSITION Z LOADING POSITION Drawing illustrates sliding work table with two selective work positions. During the machine cycle the part is hydraulically located, locked in position, broached and returned to loading position where the locating pin is removed. Avoid stopping any broaching tool during cutting stroke. Excess shock of restarting may cause serious injury.

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The American Way_ PROVEN in war... Ready for PEACE

Precision work at a mass production rate-plus the extra economy of doubled output per broach sharpening! This is a typical example of the application of American's complete broaching service to a production problem. American Broach & Machine Company engineers set up this operation to finish the sides of universal joint yokes.

An American SB-42-10 surface broaching machine is used, equipped with a special receding table incorporating two selective work positions. Extra wide broaches, more than twice the part width, make possible the use of one half of the broaching surface at a time. When this half becomes dull the position may be changed so that the remaining half continues the operation. Twice the number of parts per broach sharpening are obtained, reducing production cost and time, maintaining exceptional finish and accuracy!



PRESSES BROACHING TOOLS SPECIAL MACHINERY



Second Tube Mill Accepted On Lend-Lease Account by Soviet Union

Cleveland

• • • The completion of the second tube mill this year for the Soviet Purchasing Commission by the Yoder Co., forming mill manufacturers, indicates that lend-lease is providing Russia with more than munitions for war and living necessities.

The tube mill currently awaiting shipment is a duplicate of one that Yoder started to build in May, 1943, and shipped in March, 1944. Both mills have a capacity for 1½-in. to 6-in. standard pipe, formed and continuous welded from mill edged strip or skelp. Two former mills built by Yoder Co. for the Soviet Purchasing Commission under lend-lease were of similar design but with a capacity for ¼-in. to 1¼-in. o.d. tubing. The two earlier mills were shipped in the Fall of 1943.

The new Yoder mills are similar in design to other welded tube mills operating in this vicinity with certain improvements in design. Coils are placed in the coil box at the input end of the mill and are fed through pinch rolls into a five-roll leveler. No welder is necessary to weld coil ends together. The strip feeds through an edge trimmer and a continuous shot blasting machine that prepares the edges for butt, resistance welding. Scrap from the edge trimmer is automatically chopped in an accessory

unit to the trimmer.

The trimmed and prepared strip then goes through an 11-stand forming mill that forms the tube and butts the edges prior to welding. After welding, the tube is commercially straightened in a three-stand sizing and straightening mill which then propels the pipe into a flying rotary cut-off and onto the runout tables. However, if more accurate straightening is required, a cross roll straightener can be included in the mill installation.

The Yoder continuous welder features a unit transformer and electrode assembly. The transformer and electrode are in a close-coupled assembly and rotate as a unit at the speed of tube movement. Alinement rolls maintain the seam of the tube directly beneath the welding electrode. Both interior and exterior flash removal is provided.

Postwar Construction Expansion Seen

New York

• • • Construction projects contemplated for execution in the postwar period have been reported by F. W. Dodge Corp. to the number of 41,805, with an estimated total cost of \$9,-581,538,000. These projects are all for the 37 states east of the Rocky Mountains; similar listings for the 11 western states would probably increase the total by some 20 per cent. The project list has been accumulated during the past 21 months, and additional project reports are being received daily. Forty per cent of the projects by number and 45 per cent by value have been reported in the design stage.

The largest classification, numerically, of contemplated postwar projects, is private residential building, the number of projects being 19,606

and total estimated cost \$658,846,000; many of which consist of housing developments of varying numbers of buildings. Private nonresidential building projects in contemplation number 6796, with an estimated value of \$861,148,000. Public residential projects are listed to the number of 372 and a total value of \$251,619,000; public nonresidential building projects number 6274 with a total value of \$1,363,765,000.

Due principally to early and extensive planning activities by federal, state and local public planning agencies, the largest dollar volume of anticipated expenditures is in heavy engineering work, with 8373 public projects and 384 private projects contemplated, amounting to \$6,245,959,000 and \$200,201,000 respectively.

WPB Revises Rules On Acceptance of Alloy Tubing

Washington

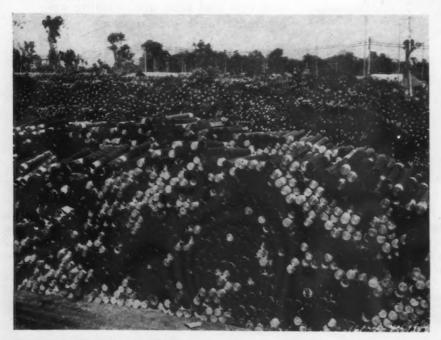
ance of direction 16 to CMP Regulation No. 2, which modifies schedule A of that regulation with respect to acceptance of deliveries of alloy steel tubing, other than airframe and engine tubing. The direction permits users, who are eligible to receive any alloy steel tubing other than airframe and engine types, to accept deliveries of the following amounts, even though their resulting inventories may exceed their requirements for the following 60-day period:

1—Tubing up to and including 7½ in. o.d.—5 tons of a given size or a minimum mill production run.

2—Tubing over 7½ in. o.d.—10 tons of a given size of a minimum mill production run.

Users who receive such deliveries, however, will not be eligible to receive further deliveries of the same item of tubing until their inventories are again within the limits prescribed by the regulation, WPB said.

EMPTY SHELL CASES: Here is a small idea of the large amount of explosives heaped on the Japs recently when they charged Yank positions on Bougain-ville in the South Pacific. Thousands of Nips were killed by the concentrated artillery fire.



V SCALY OR RUSTY STEELS V COATED STEELS V STAINLESS STEELS V MONEL METALS HIGH TENSILE STEELS AIR-HARDENING STEELS CHROME-MOLYBDENUM STEELS here's why:

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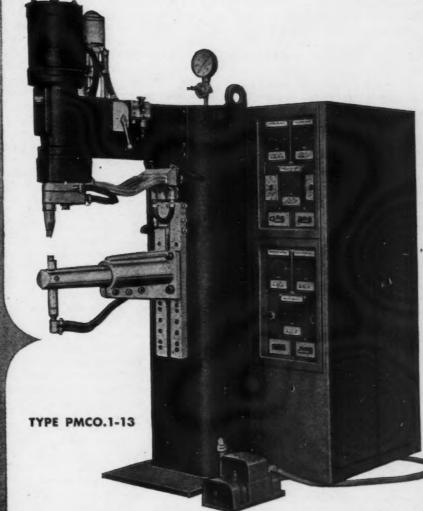
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THIS Sciaky AC Spot Welder is equipped with adjustments permitting a wide range of current and pressure values. Preheating and annealing current, quench time and variable pressure mean high quality production welds on all types of ferrous alloys and on rusty and scaly stock. The machine is rated at 60 KVA with a capacity of two thicknesses of .0.20" up to and including two thicknesses of .125. Speed on two thicknesses of .032" is 200 spots per minute. The maximum pressure delivered is 2600 lbs.

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Expert Recommends All-India Board to Set Up Steel Standards

· · Discussing the disparity between India's natural resources and their actual exploitation, Sir Padamji P. Ginwalai, director of the Steel Corp. of Bengal, Ltd., suggested recently in an article in the British publication, The Iron and Coal Trades Review, that a statutory all-India authority be set up to fix Indian Standard Specifications applicable to stee! and all manufacturing and engineering requirements for military and civilian purposes. These should have reference to Indian conditions, as regards the margin of safety, and to the indigenous raw or processed materials and industrial equipment.

One of the first duties such a body, if constituted, should be called upon to perform should be the abolition of the distinction between the basic and acid processes for the manufacture of steel. Modern research has made it clear that the process is not a decisive factor in guaranteeing the quality of the material produced. It should suffice, for all practical purposes, if the steel conforms with all the physical and chemical tests hitherto imposed on steel manufactured by the acid process, or comes up to the standard prescribed in respect to the purpose for which the steel is to be used.

There is probably no steel producing country in the world today of any importance that produces basic and foundry pig iron of such high quality at a lower cost than India, he said. That this statement is true, he pointed to the fact that India has been able to export to Japan, the United Kingdom, the United States, and many countries in Europe large quantities of iron at competitive prices and, in erected at the coal fields.

some cases, in spite of heavy tariff barriers.

India's resources of all essential raw materials, both primary and auxiliary, for iron production are claimed to be inexhaustible. The possibility of a shortage of metallurgical coal is not expected to be appreciable for a generation or two even if most pessimistic views of the situation proved well founded and if orthodox methods of iron production are not superseded in the meanwhile by other methods. If all the natural resources of India are properly mobilized. Sir Ginwalai said. there is hardly any kind of ordinary, special or alloy steel which cannot be economically manufactured in India, mainly, if not wholly, with her own raw materials.

As regards alloying agents, abundant quantities of manganese ore of good quality exist in the country. At one time, exports of this ore exceeded 1,000,000 tons a year. Owing to the shortage of good coking coal in the neighborhood of the manganese ore, the orthodox process of making ferromanganese in the blast furnace has not permitted its profitable production for export. However, the development of the electric furnace has made the production and export of ferromanganese possible, since there are abundant supplies of low grade coal in proximity to the ore mines for the generation of cheap electric power.

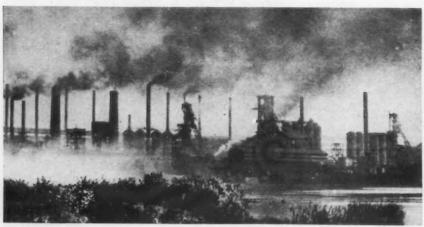
The conditions for the manufacture of ferrosilicon are almost equally favorable in Bihar and in the upper provinces, both of which are within easy distance of coalfields or of electric super-power stations that may be

Practically all mild steel produced by the two major Indian steel plants conforms to British steel specifications, but for many years preceding the war the bulk of the steel had to be sold as "untested" or "bazaar" steel in competition with that produced in other countries. India needs both good steel for engineering purposes and cheap steel for "bazaar" uses. By adapting raw materials to more modern methods, it will be possible to produce the latter and to bring it more within the means of the poorer type consumer, giving greater impetus to the expansion of the industry as a whole. In those parts of India that possess superior iron ore in proximity to some kind of cheap coal not suitable for coking, the prospects of electric iron and steel making are regarded as favorable.

Sir Ginwalai remarked that while much has been said about India's war effort for which a great deal of credit is due to organizations engaged in steel production, he doubts whether the same can honestly be said of the government or its advisers. In government statements, information is published about the importation of American and other steel, but very little has been said about the export of iron which could have been converted into steel in India had prompt measures been taken by the government during the early days.

Complete new plants were built and exported and plants in actual operation were dismantled and bodily transferred by one of the three great Allies to another or shifted from one part of a country's territory to another. If some action on these lines had been taken where India was concerned. Sir Ginwalai said, steel and other industries in India would have made tremendous strides and India would have become a real arsenal for the democracies. Sir Ginwalai stated that it is hoped that the government at last realizes that it is far better economics to develop and make the best use of what exists than to depend upon imports which, however attractive from the point of view of the future of the exporting countries, may be disastrous not only to Indian interests but also to her industrial war effort.

INDIA'S LARGEST: Smoke rises from the busy smokestacks of the Tatanager Steel and Iron Works in Calcutta, India. Tata is the largest iron and steel plant in India and is operating at near capacity.



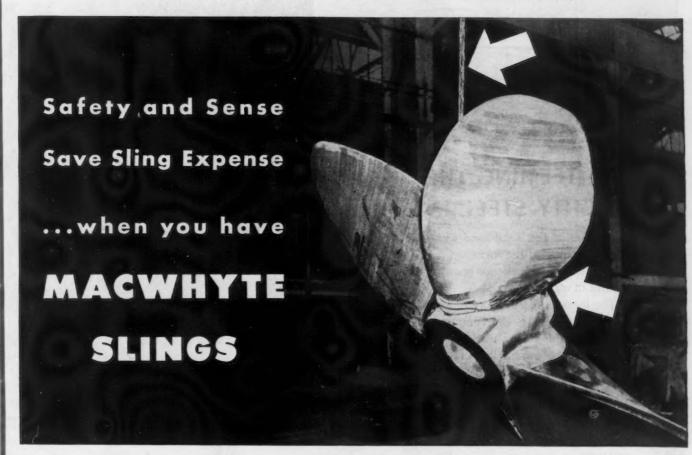
Wyckoff Sets Record

Pittsburgh

• • • Wyckoff Drawn Steel Co.'s May shipments from their Ambridge, Pa., and Chicago plants set a new all-time high production record for the company, according to Joseph T. Somers, president.

It's a whale of a job to turn one of these big ship propellers. Here again Macwhyte ATLAS Braided Wire Rope Slings came to the rescue.

Now it's comparatively simple. Do you want to improve your rigging methods? Consult Macwhyte.



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Macwhyte Slings are safe slings. Before you decide on the design of your sling gear, before you decide on how you will wrap up your load for attachment to cranes...ask Macwhyte for helpful suggestions.

You'll get practical cooperation and suggestions based on experience with hundreds of others doing jobs like yours.

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time comners, It is quite a package to rig up, but notice how nicely a set of Macwhyte ATLAS Braided Slings do the job. This set of slings was developed so it could be used for a variety of work.

All Macwhyte slings are custom built to meet your particular rigging requirements.





Hundreds of square feet of valuable storage space saved sheet steel packs stacked closer together—hours of time saved in unloading and storing each carload—easier, safer handling of 18-ton packs. Just one special Macwhyte ATLAS Braided Sling did it.

Macwhyte Slings are in great demand but our pledge to you is: "We will continually produce to the utmost of our ability without sacrifice of quality. We will study your handling needs with you and help you plan the design on which the best delivery can be made."

* Let's ALL back the attack - buy ANOTHER War Bond! *

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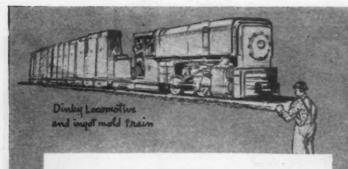
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When larger cranes are built, Macwhyte ATLAS Braided Wire Rope Slings will be made to meet their capacity



TEEMING THE MIGHTY STEEL INGOT

Steel takes its first solid form with the teeming or pouring of the ingot, an operation in which skill and experience contribute to the control of quality.

The ingot is the measure of steel production. Its teeming is the culmination of the mining of iron ore and coal, the quarrying of limestone, the production of iron in blast furnaces and the making of molten steel in open hearths and converters.

Vast quantities of raw materials are consumed and immense equipment and the labor and skill of hundreds of thousands of American workers are engaged in the processes leading up to production of the mighty steel ingot — ninety million tons of which were produced in this country last year.

Steel from these millions of tons of ingots now moves forward to invasion, arming our fighting men, affording them maximum protection as they achieve victory. And with the peace to come, new steels will serve us in new and better ways.

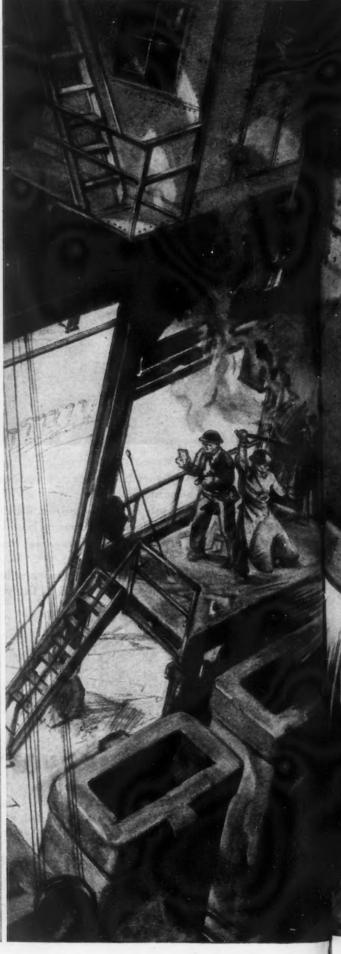
JONES & LAUGHLIN STEEL CORPORATION

J&L STEEL

PITTSBURGH, PENNSYLVANIA

CONTROLLED QUALITY STEEL FOR WAR





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FROM AN ORIGINAL DRAWING AND SKETCHES BY ORISON MACPHERSON, AT JEL PITTSBURGH WORKS

J&L STEEL RECORDS

Three world records for the production of steel and more than two thousand of its own production records (total of 2,018) were broken by Jones & Laughlin Steel Corporation works in 1942, 1943 and 4 months of 1944. "These 2,018 records since Pearl Harbor," President H. E. Lewis said, "made possible by the many thousands of men and women of J&L working in close cooperation with management, in mines, quarries, transportation lines, furnaces, mills and plants, are indeed an achievement in which all may take gratification for a job well done, and be inspired to do even better in the critical days of invasion." The records Mr. Lewis pointed out, included daily, weekly, monthly and yearly records, with 882 new highs at Pittsburgh Works, 791 at Aliquippa Works, 300 at Otis Works, Cleveland, and 45 at McKeesport, Pa., (a special ordnance plant). During this record-making period, J&L operated, and is still operating, above 100% of rated

U. S. Moritime Commission has awarded the Pittsburgh Works of Jones & Laughlin Steel Corporation its Gold Star to be added to the "M" Pennant presented last September, in recognition of continued production achievement. In congratulating the company, Admiral H. L. Vickery, Maritime Commissioner, said: "As our fighting forces press forward the advance on Berlin and Tokyo, it is my sincere hope that your company will continue to maintain or better its production record until victory is achieved." The Pittsburgh Works and the Aliquippa Works of J&L have both won the Army-Navy "E" flag with star for excellence in War production.

Fiery rivers of steel for war continuously pour out of open hearth and electric furnaces and Bessemer converters in the steel works of America into heavy cast iron ingot molds, tall as a man. The molds may be square, round, rectangular or truncated, according to ultimate shape the steel is to take in rolling and finishing mills. Each mold may have capacity for 5, 10, 12 or even 15 tons of molten steel. As easily as you would handle a bucket of water, metal crane operators adroitly swing great, thimble-shaped ladles full of tons of molten steel over the row of waiting ingot molds on low cars ("buggies") into which the steel will be teemed.

On the "teeming" platform (see illustration) the skilled steel pourer, nozzle setter, capper and metallurgical inspector move into action. First the nozzle in bottom of great ladle is cleared out, a sharp rod is pushed in, stopper handle is raised and steel bursts out in a bright stream that runs gurgling into the mold. When mold is filled, the steel pourer shuts off the fiery stream and signals craneman (upper left in illustration) to move to next mold, which he does with skill to prevent splashing. This goes on until the ladle is empty. From 10 to 40 ingots are thus teemed, depending upon sizes of molds and ladle.



* Millions of Titan "hot pressed" brass parts are being forged today for use in the valvular control systems of our submarines and other naval craft.

Because of their improved physical properties, excellent surface conditions, close tolerances and freedom from porosity, Titan "hot pressed" brass parts are performing a noteworthy service in many important war applications in these crucial days.

By applying these "hot pressed" brass parts to many vital jobs for which they had not previously been used, additional knowledge has been gained which will be of outstanding economical benefit and available to manufacturers of refrigerators, plumbing supplies, gas stoves and other domestic appliances when the war ends.

In Your Post-War Planning, Don't Overlook the Economies of Titan "Hot Pressed" Brass Parts.





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Quality Alloys By Brass Specialists

Brass and Bronze Rod • Forgings • Die Castings • Welding Rods

Postwar Prospects Of Great Britain's Steel Industry Analyzed

• • In estimating the position of Great Britain in the postwar steel markets of the world, The Metal Bulletin, a British publication, places a great deal of emphasis on the low grade ore reserves in the British Isles. These reserves, estimated at 12,000,000,000 tons, can be drawn upon if necessary to the extent of 20,000,000 tons per year averaging 30 to 35 per cent Fe.

However, the desirability and practicability of British steel producers to import ores of higher quality from Sweden, Spain, North Africa and other countries are not overlooked. If left to itself, Britain's steel industry will undoubtedly give preference to these foreign ores, as the low grade domestic ores mean larger blast furnace charges and higher cost.

Such plants as the Corby works of Stewarts and Lloyds, like the similar but larger German plant of the Hermann Goering group at Salzgitter, were especially designed to use low grade ores and can conceivably hold their own under conditions of free competition, but orthodox plants would find it impossible to operate profitably under such conditions.

While there is considerable high grade ore in the British Empire, inter-Empire preference is expected to be looked upon with askance especially by the United States. It is pointed out that it is not impossible to imagine a postwar Britain struggling for selfsufficiency, going over to the exclusive use of domestic ore. Such a conversion would mean the investment of considerable money, but unless the conversion was certain to result in cost reductions from present levels, private investors in Britain would not be forthcoming and the state would have to finance such a project. This would mean that the industry would pass under government control to a large

It is expected, based on the claims of the United Nations and especially the United States, that the world will enter into a period of free international trade after the war is won. This will be a highly competitive era, even though there will be an enormous demand for steel for reconstruction. British steel producers will have to compete mainly with American and Russian steel producers in this European reconstruction. The question of

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RACO 82 Shielded-Arc Electrodes are designed for building up worn parts and surfaces of medium-carbon steel. Best results are obtained with direct current, straight polarity, but satisfactory welds can be made with alternating current. Welds are machinable and can be bent cold or forged ... RACO 82 Electrodes meet the requirements of U.S.

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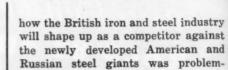
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Every RACO product owes its superiority to the twenty-five years experience that goes into its manufacture . . . quarter of a century devoted to constant improvement in materials, method and management.

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DUNDALK SALTIMORE OF MARYLAND



atical, it was pointed out.

The steel industries in the United States and Russia are organized to a much greater degree than those of Britain on the lines of big, self-contained units. The new Geneva Steel Co., with an estimated capacity of 1,500,000 tons of pig iron, 1,280,000 tons of ingots, and 900,000 tons of finished steel, and the Stalin group of plants at Magnitogorsk with capacities of 1,300,000 tons of iron and 1,500,000 tons of steel, are typical of this type of organization. On this basis, it is believed the whole of Britain's present iron and steel output

could be produced in 10 integrated

A movement is already underway towards this type of industrial consolidation, even though the units have grown up rather than been specifically built. The Dorman Long plants at Middlesbrough, Stewarts and Lloyds, United Steel Companies, and Baldwins would each form the basis for such undertakings. Promising embryos include the Ebbw Vale works in South Wales of Richard Thomas & Co., Ltd., and the Corby works at Lincolnshire. Smaller independent works producing specialty items, it was pointed out, could continue to exist alongside the giants and in districts that cannot support huge plants economically from the standpoint of raw materials, fuel, labor, costs, etc. The big plants, however, could be competitive with foreign producers and be mechanized to the limit.

The possibility of creating electric steel and ferroalloy plants in the north of Scotland, based on cheap hydroelectric power, and an iron and steel industry in the Kent coalfield was also suggested.

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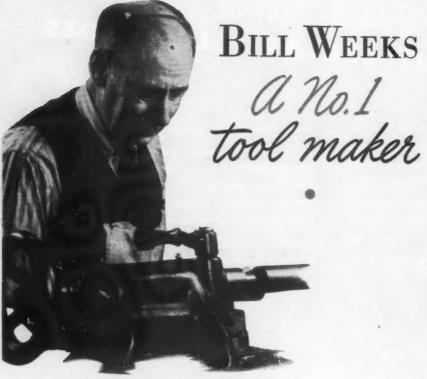
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It is the belief of the editors of The Metal Bulletin that the Ruhr Valley as a world factor in the steel industry has disappeared. Consequently, Sweden will turn to Britain as a market for ore. It is pointed out that to continue to exist. British steel capacity must be increased. If Britain doesn't supply the steel needed in world markets, other countries will and the tendencies for British colonies to produce their own steel will be further accentuated. Furthermore, while it is hoped that the coming peace will be a lasting one, the fighting of future wars depends mainly on steel.

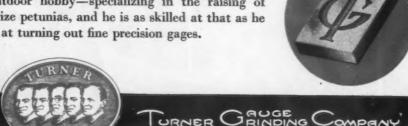


45 years experience as a tool maker-that is a record that few men can equal today! It is a record that Turner is also proud of, for it is skilled men like Bill Weeks who help us attain perfection in the manufacture of precision gauges.

When a boy, railroads appealed to Bill, and he worked in the shops of the Canadian Pacific, Southern Pacific and the Michigan Central. From there his trade took him to the Ford Motor Car Company, The Mercer Tool Company, The Wolverine Tube Company

and finally Turner's.

Like most men who work inside, his is an outdoor hobby-specializing in the raising of prize petunias, and he is as skilled at that as he is at turning out fine precision gages.



PLAST-O-LOCK PLUG GAUGES



The Plast-O-Lock (patent applied for) collet-type gauge was designed by Turner engineers to multiply the life of the gauging surface of standard plug gauges.

This is accomplished by a collet of plastic, that is slotted and tapered to fit into the tapered end of an A. G. D. handle.

Because it is plastic the collet will not scratch or burr the gauging surface, thereby allowing ost of the gauge's length to be used.

For descriptive literature and prices write our sales department today.

KENNAMETAL Lathe File Does as Much Work as 150 Mill Cut Files AND PRODUCES A BETTER FINISH! Comparative service tests continue to prove convincingly that Kennametal files multiply production, improve quality of work, and effect substantial savings in the cost of files used. For example, on the job A mill cut steel file, employed to remove the sharp edges from the

400 Brinell steel part, wore out on about 100 pieces. A Kennametal file turned out 800 pieces the first day—stayed on the job two weeks—and produced 15,000 pieces. The Kennametal file cut a curling chip—did not scrape or skid—and provided a finish that was almost as smooth as a grinding job!

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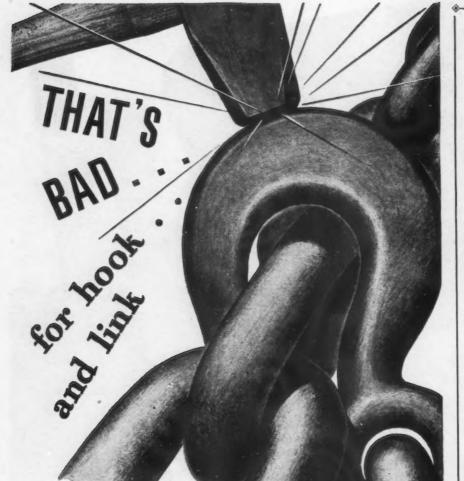
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Kennametal files outlast steel files 50 to 200 times, because their surface is made of the same hard, cemented carbide composition as steel-cutting Kennametal-tipped tools. They permit filing speeds 3 to 10 times those possible with steel files—doing an outstanding job on cast iron and brass at surface speeds around 900 feet per minute, and on high-carbon, high-chromium steels at 800 surface feet per minute. The keen, sturdy teeth of a Kennametal file will make a clean, true cut on steels up to 62 Rockwell C, a hardness that ordinary files cannot touch.

The value of any tool is measured by the quality and quantity of work it The higher original cost of Kennametal files is insignificant compared to the tremendous economies effected through their use. Order one today for test purposes—let it prove its merit in your shop.

Kennametal Lathe Files are now furnished in two sizes - 11" or 14" -and each size is available with either 20 or 30 teeth per inch. The 11" size (F-76-30 teeth/inch; F-77-20 teeth/inch) having a filing surface 4" long x 3/4" wide, costs \$12.50. The 14" size (F-86-30 teeth/inch; F-87-20 teeth/inch) having a filing surface 6" long x 34" wide, costs \$18.50. All sizes can be shipped promptly.





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PLACE! That's the sum total of this story, except the reasons, which are: You may break the hook immediately. Worse, you may damage hook or link or both internally with little evidence of the injury visible. That condition may lead to an unexpected breakdown in mid-air. Pass on to your workers the simple rules for chain safety.

You'll largely eliminate chain failure and the consequent casualties, losses and delays.

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Weldless Chain is being substituted successfully in many applications, for welded chain and manila rope. We have at present open equipment for manufacturing the following weldless chains and attachments: Tenso, some sizes, steel; Locklink, some sizes, steel; Jack, all sizes, brass and steel; American pattern, all sizes, steel; Register, all sizes, brass and steel; Safety, some sizes, brass and steel; Sash, all sizes, steel and bronze; Attachments, a full line of "S" hooks, swivel snaps, rings and special forms.

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AMERICAN CHAIN & CABLE COMPANY, INC.
BRIDGEPORT, CONNECTICUT

In Business



for Your Safety

New Training Program Started for Study Of Contract Settlement

Philadelphia

• • • • A new venture in business education began here recently with the opening of a contract settlement training program for war contractors and government representatives at the University of Pennsylvania.

The purpose of the training program, according to a spokesman, is to speed the settlement of terminated war contracts and in that way contribute to swift reconversion by giving key representatives of the government and industry intensive advance training in dealing with the problems of contract settlement.

The project will serve as a model for a nationwide training program which will use an estimated 50 colleges and universities in various parts of the country. It was indicated, however, that the development of the full program must await legislation now pending in Congress.

Training together of government and industry representatives follows the recommendation for such a program in the Report on War and Postwar Adjustment Policies made by Bernard M. Baruch and John M. Hancock on Feb. 15, 1944.

Instructors for the University of Pennsylvania course will include not only representatives of the local procurement agencies who have specialized in contract settlement, but a number of members of the regular university faculty who have taken a special course in contract settlement problems.

All of the agencies represented on the Joint Contract Termination Board are participating in the program which was worked out in cooperation with the Engineering, Science and Management War Training Division of the United States Office of Education. The E.S.M.W.T. will conduct the educational managing of these courses, based on appropriations for this purpose.

The schools will be open to representatives of all the procurement agencies on the government side and to contractors of every type including subcontractors. There are more than 90,000 war contractors and about 10,000 government representatives who may receive this special training it is estimated.

This program for teaching businessmen and government representatives ent

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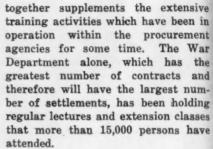
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Allegheny Ludlum Issues Financial Report to Employees

• • Following the trend established some years ago in reporting the financial condition of companies to the employees, Allegheny Ludlum Steel Corp., this week inaugurated such a plan and distributed its 1943 financial report to the company's 12,500 employees. As explained by Hiland G. Batcheller, president, the whole story of the company's wartime job, now rated at \$225,000,000, is not told in the dollar volume of business. "Many products not even thought of before the war are now being supplied in large volume and these new steels and their wartime use are expected to mean added security for all associated with the company in the peacetime era."

In respect to Allegheny-Ludlum's postwar activities, Mr. Batcheller stated that: "With the view of reemploying those now in service and of maintaining the highest possible total employment, the company will not overlook a single thing that can be done in furthering research and development and in keeping plants and equipment in condition to meet whatever the needs of the postwar period may be."

COMING EVENTS

June 26 to 30—Annual Meeting, American Society for Testing Materials, New York.

Oct. 5-7—SAE National aircraft engineering & production meeting, Los Angeles.

Oct. 5-6—AIME Electric furnace steel conference, Pittsburgh.

Oct. 10-11—Gray Iron Founders' Society, Inc., Cincinnati.

Oct. 12-14—The Electrochemical Society, Inc., Buffalo.

Oct. 16-18—AIME Fall meeting, iron and steel division, Cleveland.

Oct. 16-20—American Society for Metals, Cleveland.

Dec. 4-6—SAE National air cargo meeting, Chicago.



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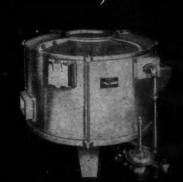
STEWAR THE BEST INDUSTRIAL FURNACES MADE

A TYPE FOR EVERY NEED

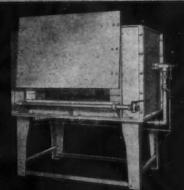
In addition to large units designed to meet specific production requirements,
STEWART also builds these famous
STANDARD INDUSTRIAL FURNACES



SEMI-MUFFLE OVEN FURNACE



ROUND POT FURNACE



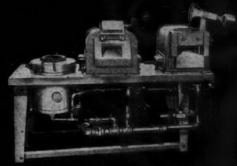
OPEN SLOT FORGE



STATIONARY METAL

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TRIPLE PURPOSE COMBINATION





HEAVY PORTABLE OVEN FURNACE



BENCH OVEN FURNACE

A letter, wire or phone call will promptly bring you information and details on STEWART Furnaces. Or, if you prefer, a STEWART engineer will be glad to call and discuss your heat-treating problems with you.

STEWART INDUSTRIAL FURNACE DIVISION OF CHICAGO FLEXIBLE SHAFT COMPANY Main Office: 5600 W. Roosevelt Road, Chicago 50, Ill. -- Canada Factory: (FLEXIBLE SYAFT CO., LTD.) 321 Weston Rd., So., Toronto

Wilson Urges Machine Tool Release

Washington

• • • The acquisition of machine tools for civilian production and the release by the government of materials needed for the manufacture of such tools are the first things to be done to shorten the period of uncertainty between the end of the war and the beginning of postwar production, according to Charles E. Wilson, president, General Motors Corp., when he testified before a special committee on postwar economic policies and planning here recently.

"I would say the first thing would be to allow industry—I am speaking about General Motors because I know the most about it—to purchase some machine tools to replace the ones we have given up in the war interest," he said.

According to the motor executive, the following plan will be worked out in detail by General Motors and each of its operating divisions:

1—We will ask the government and the services to clarify and to define the production facilities (both those belonging to the corporation and those which the corporation or others have been operating for the services) which will be made available for commercial products and also what equipment will be declared surplus, and what plants and equipment, if any, will be held as a military reserve for insurance and as part of the national defense.

We will ask for a clearly defined plan for the prompt termination of contracts, including the handling of work in process, inventories, and commitments and the liquidation and disposition of all surplus equipment which may be declared available.

2-We will resume peacetime production as promptly as possible-produce substantially our 1942 passenger car models and the other products which were in production when war was declared. They were all good productsprobably the best the corporation ever produced and should be entirely acceptable to our customers in the immediate postwar period. Perhaps a more important factor is that they are 'the only things that can be produced promptly as any program contemplating new product development and a large tooling program would so delay production that a serious unemployment period would occur.

As a part of this program all operating divisions will make lists of machine tools and equipment which have been scrapped, sold to other contractors or the government for war production, as

these machines and equipment must be promptly replaced either from surplus equipment available from former war production activities or by purchase of new equipment. This is especially important as the corporation made available to others any of its equipment it could not use on its own war production, and as a result until this equipment is replaced there will be serious holes in the production lines which would practically prevent the completion of any cars or other complete products.

If conditions permit, toward the end of the war, and after all machine tool requirements for war production have been filled, orders will be placed with machine tool builders for much of this equipment as will not be available through prompt release of machines engaged in war production.

3—The corporation will authorize the prompt ordering of materials required to produce one million cars and trucks and an equivalent quantity of the other products it produces, and at the earliest possible date when the war is over, telegrams will be sent to all suppliers and subcontractors authorizing them to start production immediately.

This follows somewhat the country's pattern for starting war production. When we realized we were unprepared, war material producers were encouraged to make any quantities they could, even though the results achieved did not give a balanced military program.

4—As soon as conditions permit, and some of this work may be possible during the war, research and product development will be resumed. The timing on this activity will depend on the progress of the war and the point of view of the government and the services. This product development is essential so that more and better things can be made for more people and is a necessary part of and must be reasonably appraised before additional expansion of the corporation's prewar facilities can be made.

5-The corporation will appropriate the hundreds of millions of dollars necessary for substantial increase in its prewar production capacity for cars. trucks. household appliances, Diesel engines and Diesel electric locomotives. Immediately after the war, a plan for the purchase of buildings from the government or others, or the construction of new facilities to carry out the program will be put into effect. This will promptly employ many men on the construction, rearrangement and tooling of these facilities and make possible the employment in the near future of men and women who will be required in the production lines to carry out the big industrial expansion for consumer goods required to expand the standard of living of the country and make more and better things.

6—At the right time the corporation will again fill its research, engineering and development staffs, and aggressively continue its past policy of continuing product improvement. This will include the development of new products and the proper exploitation of new inventions and the application to the art of metal fabrication of all scientific knowledge, use of materials and technological processes discovered and developed in the stress of war.

FLAME DAMPENER,
(3 views) of heat-resistant stainless steel... formed on hydraulic press, acetylene and spot welded, heat treated, sand blasted ... built by Brandt for use on Martin Marauders to disperse exhaust gases and flame.

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Here is an 8½ acre plant . . . with the most modern equipment for shearing, rolling, forming, welding and completely fabricating ferrous, non-ferrous and alloy metals to your specifications . . . from the lightest gauge up to and including 1½" mild steel or ¾" armor plate. Extensive war contracts necessarily limit our present acceptance of new business for immediate delivery. For information, address: Charles T. Brandt, Inc., Baltimore-30, Maryland.



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No Worse for Wear... After 8,760 Hours

SOLNUS HYDRAULIC OIL

Up to Original Specifications After 8,760 Hours Under Pressure was good for long-continued service. The

Round-the-clock operation of hydraulically-operated equipment is tough on oil unless that oil has the plus quality that helps it stand the pressure. For example, pressures up to 2,500 pounds per square inch are required on some of the hydraulic presses that draw brass cups into cartridge cases — a vital, 24-hour-a-day

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To compare oil performance, one cartridge operation. case producer put three different oils into the presses on three lines - Solnus Hydraulic Oil, a competitive oil of comparable price, and a special oil costing substantially more. All three were kept on the job for a year, and all three performed

Solnus proved its plus quality when samples of all three oils were tested. Of the three, it was the only one which retained

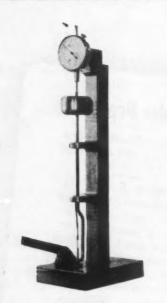
others were so deteriorated that they had to be changed.

In thousands of other cases, Solnus Hydraulic Oils and Sun Lubricants have proved their ability to stand up under pressure, longer. To help manufacturers preserve the life of their machinery and save maintenance time and labor, a new manual has been prepared by Sun Engineers entitled "How to Get the Most Out of Lubricants." It is an

authoritative guide on the proper use of lubricants. correct application, keeping systems clean, etc. A free copy is yours for the

SUN OIL COMPANY · Philadelphia 3, Pa. asking. Sponsors of the Sunoco News Voice of the Air — Lowell Thomas





It eases production headaches

• The order called for a production of thousands of tiny springs daily but the specification permitted so little variation in length under load that *individual* inspection became imperative.

To solve the problem of prohibitive costs we designed this simple but inherently accurate tester. Today one inspector—without past experience—handles the output with ease... and no rejections. For precision workmanship:—

Phone Holly 2211 or call Detroit, Cherry 4419



Why Not a 50:50 Cobalt-Copper Alloy

(Continued from Page 50)

nickel, are very much alike in properties and are therefore frequently called "sister metals."

In most investigations on high-melting alloys the surrounding atmosphere during melting is carbon monoxide. Now, since both metals form carbonyls, and thereby indicate their affinity for carbon monoxide, it occurred to the investigators that the elimination of CO during the preparation of the desired cobalt-copper alloys might lead to entirely different results. There were two approaches open:

- (1) Electrochemical, codeposition of the two metals.
- (2) Alloying in an atmosphere of hydrogen.

After many experiments, and in spite of wide variation of plating conditions in the sulfate bath no true alloy (of say 25 to 75 per cent of copper and the balance cobalt) was obtained by codeposition. It was found that the deposit was either substantially cobalt or substantially copper, depending upon relatively slight variations in pH, current density, bath temperature, and metal ion concentration and proportion. It is indicated that the cathode product is largely a matter of cathode film pH and proportion of cobalt to copper ion concentration. It would seem possible to obtain by codeposition a true cobalt-copper alloy, of say equal parts by weight, provided the cathode film pH and the cobalt to copper ion proportion were closely regulated and controlled. Such further study is contemplated.

Efforts to alloy in an atmosphere of hydrogen could be summarized as follows:

- (1) The report incorporates the results of microscopic examination and some physical tests of a series of cobalt-copper alloys prepared from powders which were compacted at pressures ranging from 1 to 100 tons per sq. in. (1.4 to 140.5 kg. per sq. mm.) and sintered in hydrogen at temperatures from 900 to 1090 deg. C.
- (2) It was found that solubility of copper in cobalt was nearly 10 per cent at room temperature, while solubility of cobalt in copper was probably less than 3 per cent. Even with this low concentration of cobalt, fine suspensions of individual particles could be distinguished in the grains of copper.
- (3) Cold work prior to alloying did not appreciably affect solubility.



MATERIAL MOVES FAST WITH STEARNS Lifting MAGNETS

Monarch Machine Tool Co. gets fast handling of chips and shavings from briquetting machine to bins or truck with a Stearns Lifting Magnet.

Only one of many jobs efficiently and economically done by Stearns Magnets. You may have a similar problem in which we can be of definitely profitable assistance.

For moving material quickly at low cost, saving hand labor on difficult and dangerous operations, increasing storage capacities—install a dependable, sturdy Steams Magnet.

Write for our Bulletin 35.

STEARNS MAGNETIC MFG. CO.

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costs and time-outs.

Selected in 1936 for the operation of hardworked drives on this 100" Plate mill such as screwdowns, side guides, etc., this EC&M Control installation is operated automatically through Pre-set Drafts and has resulted in high production of accurately finished products.

Our nearby office will be glad to explain the merits of LINE-ARC Contactor Controllers and Automatic Pre-set Control. FEATURES OF LINE-ARC

- 1. Cool operation insures long contact-life.
- Control of the arc prevents destructive burning of arc shields.
- 3. High-speed operation permits quick response—accurate moves.
- 4. Continuous capacity operating coils.
- 5. Long bearing life with nitralloy pins and self-lubricating bearings throughout.



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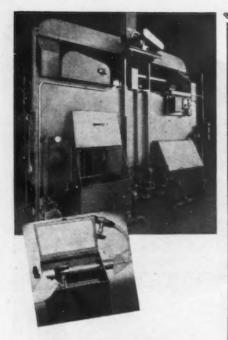
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No part is too large, too small, or too intricate to be cleaned by one of the many types and sizes of American metal wash machines.

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We will be glad to have the opportunity to prove that they will do the same for you.

Be sure to write for complete information and literature . . . doing so entails no obligation whatever.



510 S. Byrkit St., Mishawaka, Indiana

- (4) The presence of a solid solution or of a compound was suspected in 50:50 alloys heated to the melting point of copper or above, but the real nature of this constituent could not be established.
- (5) Alloys consisting of 3 per cent cobalt and 97 per cent copper exhibited a high degree of plasticity in rolling. They could be reduced into strips 40 times thinner than the pellets.
- (6) Further research is needed to account satisfactorily for a number of unusual results.

Rumor of Cutback In Ship Program Denied by Land

Washington

• • • In a statement recently, Rear Admiral Emory S. Land, chairman, United States Maritime Commission and War Shipping Administrator, spiked rumors that the commission's construction program is about to be cut back and urged shipyard workers to "turn a deaf ear to the fakers" by exerting greater effort on their jobs.

According to Admiral Land, "an epidemic of irresponsible rumors seems to have invaded most of the major shipyards of the United States. These rumors are to the effect that the Maritime Commission's construction program is about to be cut back.

"Let me say emphatically that the work load in the shipyards is to be increased very shortly and not decreased or cut back. Our current construction program and its projection into 1945 is based upon firm recommendations of the Joint Chiefs of Staff. The joint chiefs are urging us to increase our current efforts to deliver ships in every possible way and their present requirements exceed existing contracts for the most important types of ships in the program.

"It may be said, therefore, that within a few weeks additional work loads will be placed upon most of the major yards. This is, of course, contrary to current gossip, so I would like to say to every worker, man and woman, in these yards that the job has not been finished. It is not likely at this time to be finished within any period that we can foresee definitely. Consequently, I am asking-I am urging-that every man and every woman in those yards turn a deaf ear to the fakers who would mislead you. Stay in there and continue to pitch as you have done so handsomely in the past."

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Get this new illustrated booklet and see how the Adeco organization and facilities can meet your exact specifications for close-tolerance production of parts and assemblies on a contract basis. This helpful information is yours for the asking.





LP

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No Increase in Metal Can And Drum Production Expected at Present

Washington

• • • Increases in the production of metal cans and metal shipping drums for civilian goods cannot be expected at present, WPB indicated recently. It was pointed out that capacity for processing of steel for containers is under great strain in preparing sheet metal for landing barge plates, aircraft landing mats and shell cases and until there is an easing of demand for these war requirements the supply of metal for cans and drums cannot be increased.

Current production of tinplate for food cans, military and civilian, is established at approximately 2,100,000 tons for 1944, slightly in excess of 1940's production figure. Production of tinplate for non-food cans, however, has dropped to approximately one-third of the 1940 figure, with glass and fiber cans substituting for metal. More metal will be used this year than last to pack food because, weather and manpower permitting, 1944's food pack is expected to about equal the all-time high of 1942, WPB said.

Heavy sheet steel production, for industrial shipping drums, is expected to total more than 650,000 tons this year, about even with 1940, WPB said. To this production figure must be added the sheet steel required for shipping drums ordered directly by the services. To supplement steel drums in the domestic movement of goods, the production of fibre drums has been more than doubled since 1940.

The competition for rolling capac-

ity between metal containers and combat goods requiring sheet steel, occurs primarily at the "strip" and "reducing" stages, intermediate processes through which a steel ingot must pass before final rolling to the specified gage, WPB said. Capacity for these processes is limited to about 30 plants and production is fully scheduled by WPB a month or more in advance of anticipated need. Scheduling of rolling mill space assures maximum production for military requirements and, at the same time, protects output for metal containers to carry the most essential civilian goods.

Announce New Bomb Cluster Load

Wright Field, Ohio

• • • The cluster bomb, teamed with the famed block-buster demolition bomb, provides the AAF with the most destructive one-two punch known in aerial warfare. Unannounced until now for reasons of military security, the cluster bomb, designed and developed by the armament laboratory of the AAF Materiel Command at Wright Field, has long been raining death and destruction upon troops, planes and property in all war theaters.

The cluster consists of a number of small fragmentation bombs strapped together to form a single bomb, carried in any service bomb rack. Upon release, an arming wire automatically severs the bands which hold the bombs, and the cluster breaks apart in the slipstream. Then, in a dispersed pattern, the individual bombs stabilize and arc down to the target. As they hit, shrapnel covers an area 200 feet wide on both sides of the line of flight. Highly effective against planes parked at enemy airdromes, the shrapnel "scatter" is deadly when used as an anti-personnel bomb dropped into troop concentrations.

The effectiveness of single fragmentation bombs, dropped from light bombers with special bomb racks, was

recognized by AAF experts as early as 1940. Foresight dictated the use of these bombs, in quantity, by long range bombers heretofore equipped to carry only huge demolition bombs. The Materiel Command, responsible for the design, development and test of all AAF equipment, was assigned the task of devising a method by which heavy loads of small bombs could be carried and dropped by long range bombers.

New Hospital Ships to Be Used in Convoy Escort Service

Chicago

• • • Participation of Pullman-Standard Car Mfg. Co. in production of floating hospitals to accompany convoy escorts was made public here recently during the Navy trial run of the PCE (R) 853 (patrol craft escort, rescue) in Lake Michigan.

The craft contains bunks for 57 passengers and has complete hospital facilities, including a doctor, operating table, dispensary and x-ray machines. It is manned by seven officers and 100 men. Costing a million and a half dollars, the PCE's are diesel powered, 180 ft. long, displace more than 800 tons, and are equipped with guns, anti-aircraft rifles, and depth charge tracks and throwers. As well as in convoy work, the vessels may be used in connection with amphibious landing operations.

MONTHLY SHIPMENTS BY MANUFACTURERS OF ALL-METAL CANS, BY PRODUCT TO BE PACKED JANUARY-APRIL, 1944

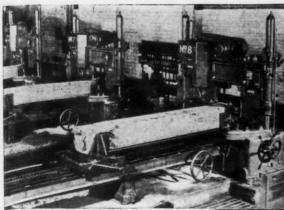
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All-Metal Cans As				. 1	Four Months
Designed for Packing	January	February	March	April	Total
Fruits and vegetables	34,801	40,279	45,270	47,602	167,952
Condensed and evaporated milk	15,667	17,662	25,860	29,573	88,762
Other dairy and poultry products	4,356	4,586	2,152	2,168	13,262
Meat	13,113	12,671	14,129	9,491	49,404
Fish and sea food	3,842	4,533	4,793	6,632	19,800
Military rations	6,492	6,048	5,499	4.887	22,926
Beer	22	0	814	2,224	3,060
All other foeds	14,990	16,676	19,940	17,987	68,693
All non-foods	13,417	12,657	17,226	16,547	59,847
				-	
Total	106,700	115,112	135,683	136,211	493,706

Source: WPB Containers Division.

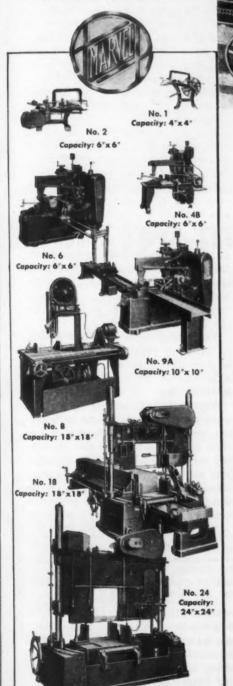
Great Lakes Steel Record

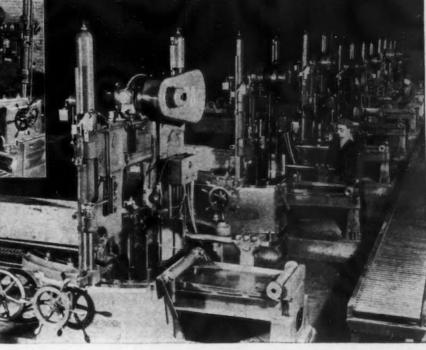
Detroit

• • • A new monthly production record of 105,046 tons of iron was established in May by the Blast Furnace Div. of Great Lakes Steel Corp. The total was 2728 tons above the previous record established in March. Last month saw the "C" furnace producing 40,654 tons, a new record for that unit.



Part of the row of No. 18 MARVEL Glant Hydraulic Hack Saws used to crop and cut-off test slices for metallurgical test for large billets of tough alloy steels.





MARVEL No. 18 Hydraulics 12 in a Row!

When a greatly expanded steel plant, near Canton, Ohio faced the problem of cropping and cutting-off test samples from large alloy billets, in *wartime* quantities and at wartime speed, they checked the performance of all types of cutting-off equipment in all their other company plants, and selected MARVEL No. 18 Giant Hydraulic Hack Saws for this "tough" job.

Now this row of twelve MARVEL No. 18 Hydraulics shown above, operating continuously, 24 hours a day on tough alloy billets of from 14" to 16" cross section, handle this tremendous, heavy duty cutting-off job without a hitch and with a minimum of man hours—only four operators per shift.

When you have a cutting-off problem your most logical first step is to check with your local MARVEL Sawing Engineer for recommendations of methods and equipment.

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 W. Bloomingdale Ave.

Chicago 39, U. S. A.

Eastern Sales Office: 225 Lafayette St., N. Y. 12, N. Y.



Backlogs Reported at Five Months

Cleveland

• • • Machine tool deliveries within the past few weeks are reported to have jumped from a former six to 12 weeks on many types to from four to six months. Previous early deliveries are in many cases now at 18 weeks minimum.

Builders' backlogs are believed to average close to five months now and one observer reports that some shops are working at no more than 60 per cent of capacity because of manpower shortages. Another factor hurting efficiency is that many older skilled mechanics who are still left after the inroads of the draft are extremely skilled in a few or perhaps a single type of operation but are not proving very versatile.

A surge toward new machine tool buying is noted and interpreted by some as a breaking down of the WPB screening process which formerly forced many potential machine tool buyers to accept idle or used machines or buy or lease idle government owned tools. Machine tool dealers state that few if any requests for new tools are being refused by WPB, particularly since delayed delivery dates make new tool acceptance much less desirable to needy buyers. There is also some thought that idle government tools are being held back for the benefit of top urgency military program contractors who cannot wait for new tool deliveries.

The WPB idle and surplus government owned machine tool survey is believed to have uncovered about 9000 tools to date, but private opinion believes this number is far under the potential total if all reporting was being done sincerely. Many of the tools being uncovered in this manner are not thoroughly useful at the present time because of their nature. War contractors' most urgent needs these days center around turret lathes, multiple spindle automatics, tapping machines and others fitting directly into the shell, fuze and booster program. Shortages of chasers are also proving a bottleneck, rendering some threading and tapping machines temporarily useless.

The government survey, according to our observer, is turning up a very

Work Being Shifted from Multiple Spindle Automatics

Cleveland

• • • Machine tool dealers here report that the current shortage of multiple spindle automatics for fuze noses and booster machining is being met by the use of dial type automatics which combine drilling, chamfering, milling and tapping in a series of vertical operations on blanks. Delivery promises on dial automatics are not quoted but, are better by months than on automatic screw machines.

few tapping machines but the emphasis has been on shell lathes, banding machines and many special machines either of the wrong size or too highly specialized to fit into current programs. Standard machine tools of most types are the shortage items of today.

Program for Using Machine Tool Surplus Given by Executive

Philadelphia

• • • Suggestions for the liquidation of surplus government-owned machine tools has been submitted by William J. Meinel, president of the Heintz Mfg. Co., Philadelphia, to the Pressed Steel Products Industry Advisory Committee of the WPB.

Government investment in machine tools is in excess of four billion dollars and we should plan for the postwar use of every such machine tool, Mr. Meinel said. Many of these machine tools now in plants which must be closed when the war is over should then be made immediately available for use elsewhere by both the war and nonwar industries.

"One step which should be helpful in developing an orderly businesslike method of government disposal and which would at the same time make these machine tools attractive investments to our private industries and thus create employment," Mr. Meinel pointed out, "would be to have the

government extend accelerated depreciation tax advantages to those American industries which eventually purchase the machine tools that are offered for sale by the government."

The first step in the disposal of surplus machine tools should be the preparation of accurate inventories by the various governmental branches of all machine tools under their control. The machines should be carefully catalogued and periodic checks made to insure their continued use on war products, he suggested. When it has been definitely established that a machine cannot be continued in use on war production at its present location, that machine should be made available for war production use elsewhere. If the machine is not placed in war work within a reasonable length of time, it should then become the subject of consideration for government disposal.

If the condition of the machine is such that it cannot be offered for sale "as is" the necessary work to restore or convert the machine to domestic use should be performed, if at all possible, by the original manufacturer of the tool. This would assure industrial purchasers, said Mr. Meinel, that machinery purchased from the government would be the equivalent of new.

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The actual work of reconverting, restoring or repairing could be done on a contract basis and would provide a backlog of work for the machine tool industry.

One method of making these tools attractive to industry would be to permit industrial purchasers of such machine tools to depreciate this machinery on an accelerated depreciation plan similar to the 60-month amortization plan made available to industries which financed their work expansion program. A certificate of necessity

Ideas of Charles E. Wilson, president of General Motors Corp., with regards to reconversion to postwar production starting now by ordering machine tools, as well as details of GM postwar planning, are shown on page 110.

could be given industrial purchasers of war machine tools at the time of such purchases. These certificates should be placed on a limited basis and be made available only to manufacturing industries which buy these used tools from the government.



But are You running a physical-culture school?

Probably not. Yet, if you are concerned with the operation of an industry in which materials must be moved, your workers may at times begin to wonder as they wrestle with bulky, heavy loads. .

Take them out of the weight-lifting business. Put them into production-faster production-by installing an R & M Hoist that makes lifting, conveying, and spotting of loads so simple that a woman can handle the job as well as a man. Eliminate the need for muscle and you make the most of your manpower.

Here are two of the many R & M Hoists that can do that for you.



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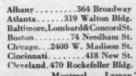
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The R & M Type F1/2 Hoist has 1000 - 2000-pound capacity. It is provided with pendent, push-button control. A step forward in improved design, better materials, and manufacturing economies that provide a better hoist at lower cost in both purchase price and operation.

The R & M Type F Hoist has 1000 - 15,000 - pound capacity. Push-button control is standard. Operating with low headroom and handling loads from any angle with perfect balance, the Type F Hoist makes a one-man job of many otherwise cumbersome operations.



Get in touch with your nearest R&M Sales and Service Office.



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HOIST & CRANE DIVISION . SPRINGFIELD, OHIO MOTORS - MACHINE DRIVES - FANS - MOYNO PUMPS - FOUNDED 1878

NON-FERROUS METALS

. . . News and Market Activities

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Hot Tinning of a Wide Range of Cast Iron

• • As a result of considerable research by the Tin Research Institute, it is possible to hot tin a wide range of cast irons. It is still necessary by this new hot tinning method to prepare such cast parts, but the procedure devised is far less complicated than processes hitherto used, such as pickling and plating with iron or copper prior to tinning.

The success of the process is judged from three aspects: The general appearance of the finished part; protection from corrosion; and its solderability or bond strength to white metal. Adhesion values between 7000 and 9000 lb. per sq. in. are consistently obtained by this process.

The development is expected to have applications in food handling equipment, increase the useful life of cast irons, and facilitate maintenance of hygienic conditions in such coated irons. Stronger soldered joints will increase durability, and a reliable bond between cast iron shells and white metal bearings will simplify and reduce the cost of many designs.

While details of the process cannot be published, firms engaged in war work have been invited to apply for the necessary sanction to use the process to the British Ministry of Supply, Department of the Director General of Scientific Research. the United States, the Battelle Memorial Institute represents the Tin Research Institute. Battelle is located at 505 King Avenue, Columbus, Ohio.

Authorization for Alloy Content

• • • Manufacturers wishing to use brass and bronze castings containing more than 74 per cent copper, or 2 per cent tin, must now apply to the WPB for authorization, unless at least one of the following conditions is met: (1) The manufacturer had been lawfully using copper base alloy for the same purpose some time during the last six months of 1943; (2) a WPB order specifically allows an alloy with higher copper or tin content, or (3) specifications of the armed services, Maritime Commission or War Shipping Administration call for a higher copper or tin content. Simultaneous

revisions of Conservation Order M-9-c and tin order M-43 effect this change.

Form New Advisory Committees

• • At the suggestion of the Non-Ferrous Foundries Industry Advisory Committee, two committees have been formed by the OPA to represent the industry. One committee is to represent the aluminum and magnesium foundries, and the other the brass and bronze foundries. Joint meetings will be held to settle price problems affecting both sections of the industry.

The committees are composed as follows:

Brass and Bronze Foundries Industry Advisory Committee

Chester K. Faunt, Christensen & Ol-in Foundry Co.

James J. Ne Foundries Div. Nelson, Cramp Brass & Iron

Charles Wegelin, Dixie Bronze Works. E. H. Holzworth, Frontier Bronze Corp.

E. W. Horlebein, Gibson & Kirk Co. William D. Goldsmith, C. A. Gold-

T. W. Pettus, National Bearing Metals

F. A. Mainzer, Pacific Brass Foundry of San Francisco.

William Kelley, Springfield Brass Co.

Aluminum and Magnesium Foundries **Industry Advisory Committee**

R. J. Roshirt, Bohn Aluminum & Brass Corp.

Leo Grant, Dow Chemical Co.

C. A. Brantingham, Ebaloy Foundries,

P. J. Keulemans, General Bronze Corp. D. W. Moll. Hills-McCanna Co.

L. E. DeGroat, Permold Co.

A. G. Harter, Quality Aluminum Casting Co.

Frank Gaines, So-Cal Foundry. H. McCullough, Springfield Bronze

& Aluminum Co. F. S. Wellman, Wellman Bronze and Aluminum Co.

Navy Conserves Critical Materials

Washington

• • • The Navy estimates that the conservation program of its Bureau of Ships has saved millions of tons of critical materials, including 30,-000,000 lb. of nickel; 9,000,000 lb. of tin; 42,000,000 lb. of aluminum; 207,-000,000 lb. of copper; 65,000,000 lb. of bronze; 38,000,000 lb. of brass and 20,000,000 lb. of rubber.

Conservation has been effected by the reduction or elimination of critical

materials from Navy specifications wherever possible, or replacement of a critical material by one whose supply is less critical.

For example, the use of titanium for alloying of high tensile steels has released vanadium for the alloying of steel shafting. This in turn has released nickel for use in the manufacture of armor place, condenser tubes, etc. Rubber is ordinarily used for the insulation on electric cable. This use of rubber has been drastically reduced by the Bureau of Ships without impairing the quality of the cable. The intensive development of low-tin content bearing metals, the development of special steels without the use of nickel as an alloving agent. the development of sisal rope, the development of synthetic rubbers and their application are specific examples of Navy conservation of critical mate-

Small Arms Ammunition Quota

• • • Fifteen hundred tons of brass has been made available by the Office of Civilian Requirements to its Government Division for third quarter requirements of small arms ammunition.

It is expected that the 1500-ton quota; also allotted in the first and second quarters of this year, will continue as long as the urgent need for small arms ammunition exists, government officials informed industry representatives at a recent meeting of the Ammunition Industry Advisory Committee.

A reserve in the form of a supplementary allotment of 1000 tons of brass was made available in the second quarter, the committee was told.

On the basis of the third quarter allotment of 1500 tons of brass, the Government Division with the assistance of the committee worked out the following production schedule:

Center fire cartridges—10 per cent of allotment (235,000,000 cartridges).

Rim fire cartridges—20 per cent of allotment (6,800,000 cartridges).

Shot gun shells—70 per cent of allotment (120,000,000 shells).

The types and calibers of these cartridges and shells are to be decided upon by agreement between government and industry, WPB said.

REFINER, SMELTER PRICES

(Cents per lb. unless otherwise noted) Aluminum, 99+%, del'd 15.00

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Aluminum	No. 12 Fdy.,	(No 2)	12 00
	deoxidizing	(140. 4)	14.00
		44 00 4-	
grades .		11.00 to	12.25
Antimony,	Asiatic, New	York No	minal
Antimony.	American, f.o	b. Laredo.	

Antimony, American, fo.b. Laredo, Tex. 14.50
Arsenic, prime white, 99% 4.00
Brass, 85-5-5-5 ingots (No. 115) 13.00
Cadmium, del'd 0.00
Cobalt, 97-99% (dollars per lb.) \$2.11
Copper, electro, Conn. Valley 12.00
Copper, electro, New York 11.75
Copper, lake 12.00
Copper, lake 12.00
Copper, beryllium, 3.75-4.25% Be;
dollars per lb. contained Be. \$17.00
Gold, U. S. Treas, dollars per troy oz. \$7.50
Indium, 99.5%, dollars per troy oz. \$7.50
Iridium, dollars per troy oz. \$165.00
Lead, St. Louis 6.35
Lead, New York 6.50
Magnesium, 12-in. sticks, carlots. 30.00
Mercury, dollars per 76-lb. flask, f.o.b. shipping point or port of entry \$191 to \$193.00
Nickel, electro 35.00
Palladium, dollars per troy oz. \$24.00
Plathum, dollars per oz. \$35.00
Plathum, dollars per oz. \$35.00
Silver, open market, New York, cents per oz. 44.75
Tin, Straits, New York 5.20
Zinc, East St. Louis 3.25
Zinc, New York 8.67

Copper, Copper Base Alloys

(Mill base, cents per lb.)

	E	xtruded		
		Shapes	Rods	Sheets
Copper		20.87		20.87
Copper, H.R	*		17.37	
Copper, drawn			18.37	
Low brass, 80%			20.40	20.15
High brass				19.48
Red brass, 85%			20.61	20.36
Naval brass		20.37	19.12	24.50
Brass, free cut			15.01	
Commercial bronze,				
90%			21.32	21.07
Commercal bronze.				
95%			21.53	21.28
Manganese bronze		24.00		28.00
Phos. bronze, A. 1	B			
5%			36.50	36.25
Muntz metal		20.12	18.87	22.75
Everdur, Herculoy,				
Olympic or equal			25.50	26.00
Nickel silver, 5%.			28.75	26.50
Architect bronze .		19.12		

Aluminum

(Cents per lb., subject to extras on gage, size, temper, finish, factor number, etc.)

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier; 2S and 3S, 21.2c.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.3c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

Extruded Shapes: "As extruded" temper; 2000-lb. base. 2S and 3S, factor No. 1 to 4, 25.5c.; 145, factor No. 1 to 4, 55c.; 175, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

Wire Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c.; 2, as fabricated. random or standard lengths. ¼ in., 24c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in.,

23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.: less than 25 lb., 66c.

NON-FERROUS SCRAP METAL QUOTATIONS

(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums)

Copper, Copper Base Alloys

OPA Group 1

No. 1 wire, No. 1 heavy copper. No. 1 tinned copper wire, No. 1	9.78
tinned heavy copper	9.75
No. 2 wire, mixed heavy copper.	8.78
Copper tuyeres	8.7
Light copper	7.7
Copper borings	9.7
No. 2 copper borings	8.7
Lead covered copper wire, cable	6.0
Lead covered telephone, power	
cable	6.0
Insulated copper	5.1

UPA Group 2	
Bell metal	15.5
High grade bronze gears	13.2
High grade bronze solids	11.5
Low lead bronze borings	11.5
Poblitt lined been bushings	
Babbitt lined brass bushings	13.0
High lead bronze solids	10.0
High lead bronze borings	10.0
Red trolley wheels	10.7
Tinny (phosphor bronze) borings	10.5
Tinny (phosphor bronze) solids	10.5
Copper-nickel solids and borings	9.2
Bronze paper mill wire cloth	9.5
Aluminum bronze solids	9.0
Soft red brass (No. 1 composition)	9.0
Soft red brass borings (No. 1)	9.0
Gilding metal turnings	8.5
	8.
Contaminated gilded metal solids	
Unlined standard red car boxes	8.2
Lined standard red car boxes	7.7
Cocks and faucets	7.
Mixed brass screens	7.
Red brass breakage	7.1
Old nickel silver solids, borings	0.2
Copper lead solids, borings	6.5
Yellow brass castings	6.5

OP 4 Croup 2

Ol A Growp o	
Yellow brass soft sheet clippings.	8.625
Yellow rod brass turnings	8.371
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	7.50
Old rolled brass	7.00
Admiralty condenser tubes	7.50
Muntz metal condenser tubes	7.00
Plated brass sheet, pipe reflectors	6.50
Manganese bronze solids	7.25
Manganese bronze solids	6.25
Manganese bronze borings	6.50
Manganese bronze borings	5.50
management bronze bornige	

Automobile		t	or	8		0			0			7.00
OPA Group	5											
Refinery bra	SS .				0	0		•		0	0	5.00

*Price varies with analysis. Lead content 0.00 to 0.40 per cent. Lead content 0.41 to 1.00 per cent.

Other Copper Alloys

			o Diace		
ings					8.6
Cartri	dge Br	rass Tu	rnings,	Loose	7.8
Loose	Yellow	Brass	Trimm	ings	7.8

All S-type all	oys (ex	C	ej	pi	t	97	35	3)			×	8.50
2S solids													8.00
High grade a	lloys			*									7.00
Low grade al	loys .												6.50
Borings and t	turnin	gs											
High grade	alloys												5.50
Low grade													5.00

Plant scrap, mixed

Obsolete scrap

Full Cable	0.00
	7.00
Old castings and forgings	6.50
Pistons, free of struts	6.50
Pistons, with struts	4.50
Old alloy sheet	5.50

For old castings and forgings, pistons. sheets, add ½c. lb. for lots 1000 to 19,999 lb.; for other scrap add 1c.; for lots over 19,999 lb. add 1½c. a lb.

Magnesium

Segregated plant scrap Pure solids and all other solids, exempt Borings and turnings 8.00

Mixed contaminated plant scrap

Grade	1	solids							11.00
Grade	1	borings	and	turnings			•		7.00
Grade	2	borings	and	turnings		0			5.00
	Grade Grade Grade	Grade 1 Grade 2	Grade 1 solids Grade 1 borings Grade 2 solids	Grade 1 solids Grade 1 borings and Grade 2 solids	Grade 1 solids				

For lots over 1499 lb. add 1c. per lb.

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zine scrap	5.78
Unsweated zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead inc. cable, for f.o.b. point of shipment price.

Nickel

Ni content 98+%, Cu under ½%, 26c. per lb.; 90 to 98% Ni, 26c. per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes	
(Cents per lb., f.o.b. shipping poi	nt)
Copper: Cast, elliptical, 15 in. and longer Electrolytic, full size	25 1/8 22 7/8
cut to size Rolled, oval, straight, 15 in. and longer Curved	30 1/4 23 1/4 24 1/4
Brass: Cast, 82-20, elliptical, 15 in. and longer	23 %
Nickel: 99% plus, cast	47
(1-9) oz., per oz	58

Chemicals		
(Cents per lb., deliver	ry from New York	k)
Copper cyanide, tech bbls. 1-5		
Copper sulphate, 99.5 bbls.	crystals,13.00-13.	50
Nickel salts, single	34.00	
Silver cyanide, 100 oz	., lots40.82-41.1	35
Sodium cyanide, 96 100-lb. dms		
Zinc cyanide, 100-lb.	dms 33.00	
Zinc, sulphate, 89%		

Market Weak for Light Grades

New York

• • • Mills continue to shy away from any heavy accumulations of scrap, and inventories are being kept close to consumption rates. A large part of the cause for this is the current success of the invasion in Europe. A price drop is believed inevitable if the war continues to go well, and no one, including the yards, wants to get caught with high priced scrap.

Scrap yards, of course, are promoting the buying theory that mills, no matter how well stocked, should continue to make purchases to keep at least some continuity to the flow of scrap. The Cleveland district reports this week indicate that the practice has been to shut off purchases entirely when stocks are adequate at the mill. This, the yards claim, discourages the search for new scrap, since the yards likewise are reluctant to carry all of the inventory.

Recent indications are that WPB is concerned to some extent about the scrap inventories. It has been suggested that government stockpiling appears necessary as no private enterprise is willing to run the risk.

Meanwhile the Bureau of Mines reports that scrap stocks at the end of April, 1944, were 4,539,000 tons of purchased material and 1,393,000 tons of home scrap, totaling 5,932,000 gross tons. There has been a continual decline in stocks since December, 1943, and it is probably the trend as much as the actual physical inventories that has aroused the concern of WPB and other Washington bureaus. While stocks decline, there is no letup whatsoever in consumption, which continues at slightly under 4½ million tons per month.

Meanwhile, stock trading continues at a high rate on the heavier materials but the market is almost stagnant on the lighter grades such as carbon and alloy turnings, and alloy solids and low phos scrap. On the better grades the scrap ceilings are holding firm, but on the lighter stuff there has been widespread cutting of prices in order to move the heavy accumulations. At some points drastic cuts from ceiling prices are being offered on specific grades, but there are no indications that such sales are being made. For example, in New York it was reported that one mill offered \$5 per ton for alloy scrap, delivered; at Buffalo, one plant recently offered something in the neighborhood of \$12.50 per ton for turnings which carry a ceiling of \$14.25.

PITTSBURGH—Except for alloys and turnings the market here is still strong, with good grades of heavy melting scrap in demand. Supplies are none too plentiful, but so far there is no indication of a serious shortage. Some companies are watching their inventory closely, however, in order to keep a good "balance."

CHICAGO-A stronger tone pervades the market for blast furnace material, but lack of local transactions prevents determination of the extent to which prices may have been strengthened as a result of the large purchase of short turnings at ceiling price reported last Some transactions have taken place in outlying Indiana districts at higher than previously prevailing market prices. The time is fast approaching, however, when mills which have been awaiting military developments before making advance commitments must decide whether the strong demand for finished steel will continue into 1945. If decision is made that current operating rates will be maintained, a far more active scrap market appears inevitable.

BOSTON—No trouble is experienced in selling heavy melting steel, bundled material, shafting, cast iron and other wanted material. The only trouble is in getting it. No. 1 industrial busheling is moving fairly freely at \$15.08 a ton. Disposal of turnings and low phos scrap grows steadily more difficult. Brokers claim mills are making a concerted effort to "bear" the scrap market. One of the very few yards with a representative supply of breakable cast on hand claims to have a 75 days' supply.

NEW YORK-Steel mills are limiting purchases of scrap in the belief that an early termination of the war in Europe may result in a drastic reduction of prices. This restriction of inventories anplies even to heavy scrap and No. 1 bundles, but heavy scrap will remain relatively scarce for the duration of the war. Dealers are operating at a capacity governed by available manpower. Rejections of scrap by one of the larger eastern consumers have been so high that dealers have been reluctant to ship. Consequently, scrap stocks at this plant fell off to the point that WPB has had to allocate shipments. Several dealers have indicated an unwillingness to ship even on allocation from WPB. While the market has been strong for the heavier grades of scrap, turnings, low phos, and alloys have been begging for buyers. One mill is reported to have cut its offers for alloys to \$5 per ton.

PHILADELPHIA - All consumers but one are now accepting scrap shipments. However, most receipts are on a scheduled basis. The number of rejections due to contamination seem to be declining as dealers have become more wary of car contents. Because of the pig iron shortage, cast is in very great demand but the supply is too limited to supply all requests. Open hearth grades are moving easily at ceiling price but turnings continue inactive even at \$1.25 below ceiling. Several scrap men here have expressed their approval of lowered inventories at the mills.

BUFFALO—Scrap operations continue on a nominal basis locally while barge canal shipments increase. The first scow to reach the Wickwire dock this season has been unloaded and additional receipts are reported by Bethlehem and Republic. As a result of the shipments from seaboard, all the district's steelmakers now are in a favorable condition. No sales of turnings have been reported since the last one at \$13, which was \$1.25 below the ceiling. The area's leading consumer is reported to be well loaded and out of the market for this item.

CLEVELAND-Blast furnace scrap is reported in strong demand here with supplies temporarily inadequate. layed boat shipments have interfered with turnings delivery and caused some use of allocations on the grade. Mill stocks of most grades seem rather high and buying has been at low ebb due to reluctance to build larger stocks. Some shipments are still going out to the Valley, mostly No. 2 steel. Ceilings are being observed rather closely as only old orders are being filled except on blast furnace. The demand for this product has maintained the price. Yards report very poor scrap collections which are expected to get worse during the summer.

CINCINNATI—The market in the Cincinnati area has quieted perceptibly in the last week, as mills tend to back away from the market. No cancellations, however, are reported since mills are apparently taking all that has been on contract, but they are refusing to increase their current supplies. Mills are reported to be in good inventory position and are tending to postpone any discussion of further ordering for 30 days.

ST. LOUIS — Steel mills in the St. Louis industrial district are using more scrap iron than they are receiving, but still are in a comfortable inventory position. Granite City Steel Co. is expected soon to release dealers' scrap, which had been held up because of the strike now settled.

BIRMINGHAM—No pickup is evident in a currently dull market here for open hearth and foundry grades. A fair demand exists for blast furnace scrap. Dealers assert that the labor situation has reached its most serious stage since the beginning of the war.

SCRAP PRICES

Railroad Steel and Cast Scrap Price Schedule

	letting els; N sel Ax	Boxes, and Tanks; Flues, Tubes, and and Steel; Uncut Iron and/or Steel; Locomotive Tenders			and Borings				Lengths; Iron Arch	Rerolling; Uncut Tires; Side Frames; Angles			der; No. 3 Steel I; Couples and		olling or Reforging For Other Uses.
BASING POINT	No. 1 and No. 2 Heavy Melti fron and/or Steel Wheels; Wheels; fron and/or Steel Bolster and Side Frames	No. 1 Bushelings; Steel Bars; Boilers, Fire Boi No. 2 Cast Steel; Fir Pipes; Limed Ind Structural Wrought Ind Destroyed Cars and Loc	No. 2 Bushelings	No. 1 Turnings	No. 2 Turnings, Drillings,	Uncut Frogs and Switches	No. 1 Sheet Scrap	No. 2 Sheet Scrap	Scrap Rails, Random Ler Bars, 3 ft. and Under	Rerolling Rails for Rerolli Cut Bolsters and Side and Splice Bars	Cut Rails, 3 ft. and Under	Cut Raile, 2 ft. and Under	Cut Rails, 18-in. and Under; Wheels; Spring Steel; Knuckles	Gut Tires	Solid Steel Axles For Rerolling or Reforging Use Only. Base Price For Other Uses.
						(Dellars	Per Gr	oss Ton)							
Pittsburgh, Canton, Youngstown, Wheeling.						(Donars	rei di	055 1011)							
Sharon, Steubenville Cleveland, Cincinnati, Ashland, Portsmouth.	\$21.00	\$20.00	\$17.50	\$19.50	\$15.00	\$20.50	\$16.00	\$14.00	\$22.00	\$23.50	\$24.00	\$24.25	\$24.50	\$25.50	\$27.0
Middletown	20.50	19.50	17.00	19.00	14.50	20.00	15.50	13.50	21.50	23.00	23.50	23.75	24.00	25.00	28.5
Sparrows Point, Wilmington . Buffalo . Kokomo .	19.75 20.25 19.25	18.75 19.25 18.25	16.25 16.75 15.75	18.25 18.75 17.75	13.75 14.25 13.25	19.25 19.75 18.75	14.75 15.25 14.25	12.75 13.25 12.25	20.75 21.25 20.25	22.25 22.75 21.75	22.75 23.25 22.25	23.00 23.50 22.50	23.25 23.75 22.75	24.25 24.75 23.75	25.7 26.2 25.2
Duluth	19.00	18.00	15.50	17.50	13.00	18.50	14.00	12.00	20.00	21.50	22.00	22.25	22.50	23.50	25.0 24.8
Detroit St. Louis Birmingham, Los Angeles.	18.85 18.50	17.85 17.50	15.35 15.00	17.35 17.00	12.85 12.50	18.35 18.00	13.85 13.50	11.85	19.85 19.50	21.35 21.00	21.85 21.50	22.10 21.75	22.35 22.00	23.35 23.00	24.6
San Francisco	18.00 17.00	17.00 16.00	14.50	16.50	12.00	17.50	13.00	11.00	19.00	20.50	21.00	21.25	21.50 20.50	22.50 21.50	24.0
Seattle	15.00	14.00	13.50 11.50	15.50 13.50	9.00	16.50 14.50	12.00	10.00	18.00	19.50	29.00	20.25	18.50	19.50	21.0

SALES REGULATIONS: On and after March 15, 1944, no operating railroad not operating in a basing point named may sell or offer for sale iron and steel scrap to a consumer or his broker without obtaining prior written approval from OPA unless prior to that date it has filed with OPA a statement in writing setting forth maximum on-line price for No. 1 Railroad Heavy Melting Steel and describing the method used to calculate this price. The statement shall include: The most favorable basing point selected; the price at such basing point; the location of the scrap accumulation point; the lowest established charge for transporting scrap by rail from such accumulation point to the named basing point; and the foreign line proportion of such lowest established charge.

MAXIMUM PRICES: The maximum on-line price of any grade of

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ip. on ce lished charge for transporting scrap by rail from such accumulation point to the named basing point; and the foreign line proportion of such lowest established charge.

MAXIMUM PRICES: The maximum on-line price of any grade of steel scrap from an operating railroad operating in a basing point shall be the price set for the scrap at the highest priced basing point in which the railroad operates. For an operating railroad not operating in a basing point, the price shall be the price set for the scrap at the most favorable basing point less the foreign line proportion of the lowest charge for transporting scrap by rail from scrap accumulating point of railroad to such basing point. "Scrap accumulation point is that point from which greatest tonnage was shipped in 1943. "Most favorable basing point" that the basing point which will yield the highest maximum on-line price. In no case need the on-line maximum price fall below \$15.00 per gross ton for No. 1 Railroad Heavy Melting Steel. The maximum price of any grade of steel scrap originating from a non-operating railroad shall be the price established for the scrap at the most favorable basing point minus the transportation charges for rail, vessel, or motor vehicle shipment or combinations of these, and for established charges shown in OPA Price Schedule No. 4. Where the non-operating railroad is located in a basing point shown above, the following switching charge deductions will be applicable: Chicago-\$4c.; Pittaburgh-55c.; Detroit-55c.; Seattle-38c.; Buffalo-36c.; Birmingham and Kansas City-32c.; Ashaland, Canton, Cincinnati, Duluth, Kokomo, Portsmouth, Steubenville, St. Louis, Wheeling, and Wilmington-28c.; Middletown and Philadelphia-14c.; and Sparrows Point-11e.

SCRAP PREPARATION: With the exception of unprepared scrap prepared in-transit, railroad steel scrap prepared by a dealer or moving through a dealer's yard shall be deemed to have lost its railroad origin, and shall be classified and priced as steel scrap other than railroad scrap except in specified

PREPARATION CHARGES: If unprepared scrap is purchased from an originating railroad, the consumer may designate a dealer to prepare such scrap on a preparation fee basis. The maximum preparation fee shall be the established differentials between the unprepared scrap and the listed grade for which the scrap is prepared. For example:

\$3.50 per gross ton for prepared No. 1 Railroad Heavy Melting Steel from Structural and/or Wrought Iron and Steel Uncut; or \$2.50 for cutting rails 18-in. and under from Scrap Rails of Random Lengths; or \$4.00 per ton for No. 2 Bundles prepared from No. 1 Sheet Scrap. For cast, an in-transit preparation fee will be applicable only for preparing Cast Iron No. 3 into Cast Iron No. 1, for which the maximum preparation fee shall be \$3.50 per gross ton. (Previous dealer fee was \$2.50.)

MAXIMUM PRICE ON PREPARED SCRAP: The maximum delivered price for railroad scrap prepared in-transit shall be the maximum on-line price for the unprepared scrap, plus the applicable rail transportation charges incurred in moving scrap to dealer's yard, plus the applicable preparation fee, plus transportation charges from the dealer's yard to point of delivery.

Cast Iron Scrap

Maximum on-line price, per gross ton, for any of the following cast grades will be the price shown at the highest priced zone in which the railroad operates or is located.

	Per Gross Ton					
	Zone A	Zone B	Zone C			
Cast Iron, No. 1. Cast Iron, No. 2. Cast Iron, No. 3. Cast Iron, No. 4. Cast Iron Brake Shoes. Malleable Wheels, No. 1.	\$18.00 17.00 14.50 13.25 13.25 20.00	\$19.00 18.00 15.50 14.25 14.25 21.00	\$20.00 19.00 16.50 15.25 15.25 22.00			

Zone A includes Mout., Idaho, Wys., Nev., Utah, Ariz., and N. M. Zone B includes N. D., S. D., Neb., Colo., Kan., Okla., Texas, and Fla. Zone C includes all states net named in zones A and B, and includes switching district of Kansas City, Kansas-Missouri.

CAST IRON GRADE DEFINITIONS: Cast Iron, No. 1—Cast iron scrap such as columns, pipe, plates and/or castings of miscellaneous nature, but free from stove plate, brake shoes, and/or burnt scrap. Must be cupola size not over 24 x 30 in. and no pieces to weigh more than 150 lb. Free of foreign material. No. 2—Cast iron scrap in pieces weighing over 150 lb. not more than 500 lb. and free from burnt cast. No. 3—Cast iron scrap in pieces over 500 lb., includes cylinders, driving wheel centers, and/or all other castings. Free from hammer blocks or bases. No. 4—Burnt cast iron scrap such as grate bars, stove parts, and/or miscellaneous burnt scrap. No. 5—Driving and/or car brake shoes of all types except composition filled. Malleable—Malleable parts of automobiles, railroad cars, and locomotives. No. 7—Wheels, No. 1, includes cast iron car and/or locomotive wheels.

Comparison of Prices . . .

lat Rolled Steel: June 27,	June 20,	May 23,	June 29,	Pig Iron: June 27, June 20, May 23, June 29,
(Cents Per Lb.) 1944	1944	1944	1943	(Per Gross Ton) 1944 1944 1944 1943
Hot rolled sheets 2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia\$25.84 \$25.84 \$25.89
Cold rolled sheets 3.05	3.05	3.05	3.05	No. 2, Valley furnace 24.00 24.00 24.00 24.00
Galvanized sheets (24 ga.) 3.50	3.50	3.50	3.50	No. 2, Southern Cin'ti 25.11 25.11 25.11 24.68
Hot rolled strip 2.10	2.10	2.10	2.10	No. 2, Birmingham 20.38 20.38 20.38 20.38
Cold rolled strip 2.80	2.80	2.80	2.80	No. 2, foundry, Chicago† 24.00 24.00 24.00 24.00
Plates 2.10	2.10	2.10	2.10	Basic, del'd eastern Pa 25.34 25.34 25.34 25.39
Plates, wrought iron 3.80	3.80	3.80	3.80	Basic, Valley furnace 23.50 23.50 23.50 23.50
Stain's c.r. strip (No. 302) 28.00	28.00	28.00	28.00	Malleable, Chicago† 24.00 24.00 24.00 24.00 Malleable, Valley 24.00 24.00 24.00 24.00
in and Terne Plate:				Malleable, Valley 24.00 24.00 24.00 24.00 L. S. charcoal, Chicago. 37.34 37.34 31.34
(Dollars Per Base Box)				Ferromanganeset135.00 135.00 135.00 135.00
	25 00	es 00	\$5.00	refromanganeset155.00 155.00 156.00
Tin plate, standard cokes \$5.00 Tin plate, electrolytic 4.50	\$5.00 4.50	\$5.00 4.50	4.50	†The switching charge for delivery to foundries in the Chi-
Special coated mfg. ternes 4.30	4.30	4.30	4.30	cago district is 60c. per ton. tFor carlots at seaboard.
opecial conted mig. termes 4.00	4.00	4.00	2.00	troi cariots at seasoari.
Bars and Shapes:				
(Cents Per Lb.)				Scrap:
Merchant bars 2.15	2.15	2.15	2.15	(Per Gross Ton)
Cold finished bars 2.65	2.65	2.65	2.65	Heavy melt'g steel, P'gh.\$20.00 \$20.00 \$20.00 \$20.00
Alloy bars 2.70	2.70	2.70	2.70	Heavy melt'g steel, Phila. 18.75 18.75 18.75
Structural shapes 2.10	2.10	2.10	2.10	Heavy melt'g steel, Ch'go 18.75 18.75 18.75
Stainless bars (No. 302). 24.00	24.00	24.00	24.00	No. 1 hy. comp. sheet, Det. 17.85 17.85 17.85 17.85
Wrought iron bars 4.40	4.40	4.40	4.40	Low phos. plate, Youngs'n 22.50 22.50 22.50
Wire and Wire Products:				No. 1 cast, Pittsburgh 20.00 20.00 20.00 20.00
(Cents Per Lb.)				No. 1 cast, Philadelphia. 20.00 20.00 20.00 20.00
Plain wire 2.60	2.60	2.60	2.60	No. 1 cast, Ch'go 20.00 20.00 20.00 20.00
Wire nails 2.55	2.55	2.55	2.55	
10 Halls 2.00	2.00	2.00	2.00	
Rails:				Coke, Connellsville:
(Dollars Per Gross Ton)				(Per Net Ton at Oven)
Heavy rails\$40.00	\$40.00	\$40.00	\$40.00	Furnace coke, prompt \$7.00 \$7.00 \$6.50
Light rails 40.00	40.00	40.00	40.00	Foundry coke, prompt 8.25 8.25 7.50
Sami Finish al Garata				
Semi-Finished Steel: (Dollars Per Gross Ton)				Non-Ferrous Metals:
	204.00	90400	204.00	
Rerolling billets\$34.00	\$34.00			(Cents per Lb. to Large Buyers)
Sheet bars 34.00	34.00	34.00	34.00	Copper, electro., Conn 12.00 12.00 12.00 12.00
Slabs, rerolling 34.00 Forging billets 40.00	34.00 40.00			Copper, Lake 12.00 12.00 12.00 12.00
Alloy blooms, billets, slabs 54.00	54.00			Tin (Straits), New York. 52.00 52.00 52.00 52.00 Zinc. East St. Louis 8.25 8.25 8.25 8.25
side side side side side side side side	04.00	04.00	0-2.00	
Wire Rods and Skelp:				Lead, St. Louis 6.35 6.35 6.35 6.35 Aluminum, Virgin, del'd. 15.00 15.00 15.00 15.00
(Cents Per Lb.)				Nickel, electrolytic 35.00 35.00 35.00 35.00
(Cents Fer Lo.)				
Wire rods 2.00	2.00	2.00	2.00	Magnesium, ingot 20.50 20.50 20.50 20.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 125-134.

June 27, 194	142.25513c	. a Lb	23,61	a	Gross Ton		\$19.1	7 a	Gross Ton	
One week as	go2.25513c	. a Lb			Gross Ton				Gross Ton	
One month a	ago2.25513c	a Lb	23.61		Gross Ton				Gross Ton	
One year ac	go2.26190c	a Lh	99 61		Gross Ton				Gross Ton	
one your ag			20.01	24	Gross Ton			1 22	Gross Ton	
	HIGH	LOW	HIGH		LOW		HIGH		LOW	
1943	2.25513c.,	2.25513c.,	\$23.61		\$23.61		\$19.17		\$19.17	
1942	2.26190c.,	2.26190c.,	23.61		23.61		19.17		19.17	
1941	2.43078c.,	2.43078c	\$23.61, Mar.			2	\$22.00. Jan.	7	\$19.17, Apr.	10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec.				21.83, Dec.	30		
1939	2.35367c., Jan. 3	2.26689c., May 16					22.50. Oct.	3	14.08, May	16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June	21			15.00. Nov.	22	11.00, June	7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar.	9	20.25, Feb.	16	21.92, Mar.	30	12.67, June	8
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov.	24	18.73, Aug.	. 11	17.75, Dec.	21	12.67, June	9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov.	5	17.83, May	14	13.42, Dec.	10	10.33, Apr.	29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May	1	16.90, Jan.	27	13.00, Mar.	13	9.50, Sept.	25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec.	5	13.56, Jan.	3	12.25, Aug.	8	6.75, Jan.	3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan.	5	13.56, Dec.	6	8.50, Jan.	12	6.43, July	5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan.	6	14.79, Dec.	15	11.33, Jan.	6	8.50, Dec.	29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan.	7	15.90, Dec.	16	15.00, Feb.	18	11.25, Dec.	9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May	14	18.21, Dec.	17	17.58, Jan.	29	14.08, Dec.	3
	Weighted inde	x based on steel								

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, steel scrap quotations to consumers at Pittsburgh. Philadelphia and Chicago.

Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. Extras apply. Delivered prices do not reflect 3% tax on freight. (1) Mill run sheet, 10c. per lb. under base; primes 25c. above base. (2) Unassorted 8-lb. coating. (3) Widths up to 12-in. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25c. per 100 lb. to fabricators. (8) Also shafting. For quantities of 20,000 to 29,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (12) Boxed. (13) Portland and Seattle price, San Francisco 2.50c. (14) This base price to be used in figuring annealed, bright finish wires, commercial spring wire.

Basing Point													10	DEL	VERED	TO
Product	Pitts- burgh	Chicago	Gary	Cleve-	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite	Middle- town. Ohio	Gulf Ports, Cars	Provo, Utah	Pacific Ports, Cars	Detroit	New York	Phila- delphia
Hot Rolled Sheets	2.10∉	2.10€	2.10€	2.10€	2.10€	2.10€	2.10¢	2.10∉	2.20€	2.10∉			2.65€	2.20∉	2.34#	2.27#
Cold Rolled Sheets1	3.05€	3.05∉	3.05€	3.05€		3.05€	3.05€		3.15€	3.05∉			3.70€	3.15∉	3.39∉	3.376
Galv. Sheets (24 gage)	3.50∉	3.50∉	3.50∉		3.50€	3.50€	3.50€	3.50€	3.60∉	3.50€			4.05¢		3.74¢	3.67€
Enameling Sheets (20 gage)	3.35€	3.35€	3.35€	3.35€			3.356		3.45∉	3.35∉			4.00€	3.45∉	3.71#	3.676
Long Ternes ²	3.80∉	3.80∉	3.80€										4.55∉		4.16#	4.12¢
Hot Rolled Strip ²	2.10€	2.10¢	2.10€	2.10¢	2.10€		2.10∉			2.10∉			2.75∉	2.20∉	2.46∉	
Cold Rolled Strips	2.80€	2.90€		2.80€			2.804	(Wor	cester =	3.00€)				2.90∉	3.16¢	
Cooperage Stock Strip	2.204	2.20e			2.204		2.20€								2.56€	-
Commodity C-R Strip	2.95€	3.05€		2.95€			2.95€	(Wor	cester =	3.35¢)				3.05€	3.316	
Coke Tin Plate, Base Box	85.00	\$5.00	\$5.00					-	\$5.10						5.36#	5.326
.50)	\$4.50	84.50	\$4.50						\$4.60							
.75 Electro Tin Plate, Box	\$4.65		\$4.65						\$4.75							
Black Plate (29 gage)	3.05€	3.05€	3.054						3.15€				4.05419	-		3.376
Mfg. Ternes, Special Box	\$4.30	\$4.30	\$4.30						\$4.40							
Carbon Steel Bars	2.15€	2.154	2.15¢	2.15€	2.154	2.15€		(D)	luth = 2.	256)	2.50€		2.80€	2.25€	3. 49¢	2.47
Rail Steel Bars	2.15€	2.154	2.154	2.154	2.156	2.15é			-		2.50€		2.80∉			
Reinforcing (Billet) Bars?	2.15¢	2.154	2.154	2.15¢	2.154	2.154	2.15€	2.15€			2.50€	-	2.55€13	2.25#	2.39#	
Reinforcing (Rail) Bars7	2.15€	2.154	2.154	3.15¢	2.154	2.15€	2.15∉				2.50€		C2.55¢13	2.25∉		3.47
Cold Finished Barss	2.654	2.65€	2.654	2.654		2.65€			(Detroit	=2.70¢)	(Tol	edo = 2.8	100		2.99¢	2.97
Alloy Bars, Hot Rolled	2.70€	2.70€	2.00			2.70€	Œ	ethicher	n. Massi	lion, Can	ton = 2.70	06)	1	2.80¢		
Ailoy Bars, Cold Drawn	3.35€	3.35€	3.354	3.354		3.35€	-							3.454		
	-		-	-		-		(Ce	atesville	and Clay	mont = 2	1.10@			0.004	0.16
Carbon Steel Plates	2.10€	2.10€	2.10€	2.10#	2.10€	_	2.10€	2.10€	2.35€		2.45€	2.60€	2.65∉	2.32#	2.29¢	2.15
Floor Plates	3.35€	3.35€							-	-	3.70€		4.00¢	-	3.71€	3.47
Alloy Plates	3.50∉	3.50€				tesville =			-		3.95	-	4.15¢	-	3.70€	3.59
Structural Shapes	2.10€	2.10€	2.10∉		2.10€	2.10€	-	Bethleh	em = 2.10)¢)	2.45¢	-	2.75¢	-	2.27€	2.21
SPRING STEEL, C-R 10.26 to 0.50 Carbon	2.80∉		1	2.80€			(Wo	reester ==	3.004)							
0.51 to 0.75 Carbon	4.30€			4.30€			(Wo	rcester=	4.50€)							
0.76 to 1.00 Carbon	6.15€			6.15€			(Wo	reester =	6.356)							
1.01 to 1.25 Carbon	8.35∉			8.35∉			(Wo	reester =	8.556)							
Bright Wirels	2.60€	2.60∉		2.60€	2.60€		(Wor	cester =	2.706)	(Duluth =	2.65€)		3.10	é		2.92
Galvanized Wire	1	-1		Add	proper	size extra	and gal	vanizing	extra to	Bright '	Wire bas	0.				
Spring (High Carbon)	3.20€	3.20€		3.20€			-	reester =					3.70€			3.52
Steel Sheet Piling	2.40€	2.40				2. 100							2 95¢			3.72

EXCEPTIONS TO PRICE SCHED. NO. 6 Slabs—Andrews Steel Co. \$41 basing pts.; Wheeling Steel Corp. \$34 Portsmouth, Ohio; Empire Sheet & Tin Plate Corp. \$41; Phoenix Iron Co. (rerolling) \$41; (forging) \$47; Granite City Steel Co. \$47.50.

Blooms—Phoenix Iron Co. (rerolling) \$41, (forging) \$47

(forging) \$47. Sheet Bar—Empire Sheet & Tin Plate Co. \$39 mill: Wheeling Steel Corp. \$38 Ports-

Sheet Bar—Empire Sheet & Tin Plate Co. \$39 mill; Wheeling Steel Corp. \$38 Portsmouth, Ohio.
Billets, Forging—Andrews Steel Co. \$50 basing pts.; Follansbee Steel Corp. \$49.50 Toronto; Phoenix Iron Co. \$47.00 mill.
Geneva Steel Co. \$64.64 f.o.b. Pacific Coast

10 9 16

25 3 29

Geneva Steel Co. \$64.64 f.o.b. Pacific Coast Ports.

Billets, Rerolling—Continental Steel Corp. may charge Acme Steel in Chicago switching area \$34 plus freight from Kokomo, Ind.: Northwestern Steel & Wire Co. Lend-Lease) \$41 mill; Wheeling Steel Corp. (small) \$36 Portsmouth. Ohio; (blooming mill sizes) applicable base, f.o.b. Portsmouth, Ohio; Stanley Works may sell Washburn Wire Co. under allocation at \$39 Bridgeport, Conn.; Keystone Steel & Wire Co. may sell Acme Steel Co. at Chicago base, f.o.b. Peoria; Phoenix Iron Co. \$41 mill; Continental Steel Corp. (1% x 1%) \$39.50, (2 x 2) \$40.60 Kokomo, Ind. (these prices include \$1 size extra); Keystone Steel & Wire Co. \$36.40 Peoria; Connors Steel Co. \$50.69 Birmingham; Ford Motor Co. \$34 Dearborn, Mich. Geneva Steel Co. \$58.64 f.o.b. Pacific Coast ports.

Structural Shapes—Phoenix Iron Co. \$2.35

basing pts. (export) \$2.50 Phoenixville; Knoxville Iron Co. \$2.30 basing points. Bar Size Shapes—(Angles) W. Ames & Co., 10 tons or over, \$3.10 mill.

Rails—Sweet Steel Co. (rail steel) \$50 mill; West Virginia Rail Co. (lightweight) on allocation based Huntington, W. Va.; Colorado Fuel & Iron Corp., \$45 Pueblo. Hot Rolled Plate—Granite City Steel Co. \$2.65 mill; Knoxville Iron Co. \$2.25 basing pts.; Kaiser Co. and Geneva Steel Co. \$2.50 basing points; Granite City Steel Co. \$2.50 basing points; Granite City Steel Co. \$2.35 Granite City.

Merchant Bars—W. Ames Co., 10 tons and over, \$2.35 mill; Eckels-Nye Steel Corp., \$2.50 basing pts. (rail steel) \$2.40; Phoenix Iron Co. \$2.40 basing pts.; Sweet Steel Co. (rail steel) \$2.35 mill; Joslyn Mfg. & Supply Co., \$2.35 Chicago; Calumet Steel Dic., Borg Warner Corp. (8 in. mill bars) \$2.35 Chicago; Knoxville Iron Co. \$2.30 basing pts. Laclede Steel Co., sales to LaSalle Steel granted Chicago base, f.o.b. Madison, Ill. Milton Mfg. Co. \$2.75 f.o.b. Milton, Pa.

Reinforcing Bars—W. Ames & Co., 10 tons and over, \$2.85 mill; Sweet Steel Co.

f.o.b. Milton, Pa.

Reinforcing Bars—W. Ames & Co., 10 tons and over, \$2.35 mill; Sweet Steel Co. rail steel! \$2.35 mill; Columbia Steel Co. st. Cold Finished Bars—Keystone Drawn Steel Co. on allocation, Pittsburgh c.f. base plus c/l freight on hot rolled bars Pittsburgh to Spring City, Pa.; New England Drawn Steel Co. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to Massfield, Mass., f.o.b. Massfield; Empire Finished Steel

Corp. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to plants f.o.b. plant; Compressed Steel Shafting Co. on allocation outside New England, Buffalo base plus c/l freight ville; Medart Co. in certain areas, Chi-Buffalo to Readville, Mass. f.o.b. Readcago c.f. base plus c/l freight Chicago to St. Louis. f.o.b. St. Louis.
Alloy Bars—Texas Steel Co. for delivery except Texas and Okla. Chicago base, f.o.b. Fort Worth, Tex.; Connors Steel Co. ahipped outside Ala., Mississippi, Louisiana. Georgia, Florida, Tenn., Pittsburgh base, f.o.b. Birmingham.
Hot Rolled Strip—Joslyn Mfg. & Supply Co. \$2.30 Chicago; Knoxville Iron Co. \$2.25 basing pts.

hot Rolled Strip—Joslyn Mfg. & Supply Co. \$2.30 Chicago; Knoxville Iron Co. \$2.25 basing pts.

Hot Rolled Sheets—Andrews Steel Co., Middletown base on shipments to Detroit or area; Parkersburg Iron & Steel Co., \$2.25 Parkersburg.

Galvanized Sheets—Andrews Steel Co., \$2.25 Parkersburg.

Galvanized Sheets—Andrews Steel Co., \$2.50 basing pts.; Parkersburg Iron & Steel Co., \$3.75 basing pts.; Parkersburg Iron & Steel Co., \$3.75 basing pts.; Continental Steel Co., Middletown base on Kokomo, Ind., product; Superior Sheet Steel Co., Pittsburgh base except for Lend-Lease.

Pipe and Tubing—South Chester Tube Co. when priced at Pittsburgh, freight to Gulf Coast and Pacific Ports may be charged from Chester, Pa., also to points lying west of Harrisburg, Pa.

Black Sheets—Empire Sheet and Tinplate Co., maximum base price mill is \$2.45 per 100 lb., with differentials, transportation charges, etc., provided in RPS. No. 6.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendments to OPA Price Schedule 49.

		SHEETS		ST	RIP		1	BA	RS	1	ALLOY	BARS	
Cities	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled	Plates ¼ in. and heavier	Structural Shapes	Hot Rolled	Cold Finished	Hot Rolled, NE 8617-20	Hot Rolled, NE 9442-45 Ann,	Cold Drawn, NE 8617-20	Cold Drawn, NE 9442-4 Ann,
"Philadelphia New York Boston Battimore Norfolk Chicage Milwaukee Cleveland Buffalo Detroit Cincinnati	3.518 3.590 3.744 3.394 3.771 3.25 3.387 3.35 3.35 3.45	4.8728 4.6133 4.7449 4.852 4.965 4.20 4.3373 4.40 4.50 4.4753	5.018a 5.010 5.2249 4.894 5.371 5.2724 4.8774 4.754 5.004 4.8255	3.922 3.9746 4.106 3.902 4.165 3.60 3.737 3.60 3.819 3.70 3.675	4.772 4.772 4.715 4.752 4.865 4.6517 4.78717 4.45 4.65917 4.65917	3.605 3.768 3.912 3.594 3.971 3.55 3.687 3.40 3.63 3.609	3.668 3.758 3.912 3.759 4.002 3.55 3.687 3.588 3.40 3.661	3.822 3.853 4.044 3.802 4.065 3.50 3.637 3.35 3.35 3.35	4.072 4.103 4.144 4.052 4.165 3.75 3.75 3.75 3.75 3.75 3.75	5.966 6.008 6.162 5.75 5.987 5.956 5.75 6.08	7.066 7.108 7.262 6.85 7.087 7.056 6.85 7.18	7.272 7.303 7.344 6.85 7.087 6.86 6.85 7.159	8.322 8.353 8.394 7.90 8.137 7.90 7.90 8.209
St. Louis 9. Pittaburgh. St. Paul Omaha Indianapolis Birmingham Memphis New Orleans Houston Los Angeles	3.397 3.35 3.51 3.865 3.58 3.45 3.9657 4.058* 3.763 5.00	4.3473 4.40 4.46 5.443 3.58 4.66 4.95 5.573 7.203	5.1724 4.75 5.2574 5.6084 4.568 4.75 3.265 5.358 6.3131 6.104	3.747 3.60 3.86 4.215 4.918 3.70 4.215 4.308 4.308 4.95	4.93117 4.45 4.3517 3.768	3.697 3.40 3.8113 4.165 4.78 3.55 4.065 4.158 4.25 4.95	3.697 3.40 3.8113 4.165 3.63 3.55 4.065 4.158* 4.25	3.647 3.35 3.7613 4.115 3.58 3.50 4.015 4.108 3.75 4.40	4.031 3.75 4.361 4.43 3.98 4.43 4.33 4.629 6.373³	6.131 5.75 6.09 6.08	7.231 6.85 7.19 7.18	7.231 6.85 7.561 7.18	8.281 7.90 8.711 8.23 9.373
San Francisco Seattle Portland Salt Lake City	4.5514 4.6512 4.6511 4.5317	7.304 7.054 6.604	6.354 5.954 5.754 6.1718	4.5014 4.2512 4.7511 5.5317	7.33317	4.6514 4.7512 4.7511 4.9617	4.3514 4.4512 4.4511 4.9817	4.1514 4.3512 4.4511 4.8817	5.583 5.333 5.783 5.533 5.90	8.304 8.304 8.304	9.404 9.404 9.404 9.404	9.404 9.404 8.304	10.454 10.454 9.404

NATIONAL EMERGENCY (N. E.) STEELS (Hot Rolled Mill Extras for Alloy Content)

-		CHEMIC	AL CO	MPOS	SITION LI	MITS, PE	R CENT			sic Hearth		ctric nace
Designa- tion	Carbon	Man- ganese	Phos- phorus Max.	Sul- phur Max.	Silicon	Chro- mium	Nickel	Molyb- denum	Bars and Bar- Strip	Billets, Blooms and Slabs	Bars and Bar- Strip	Billets, Blooms and Slabs
NE 1335 .33/ .38 1.60/1.1 NE 1340 .38/ .43 1.60/1.1 NE 1345 .43/ .48 1.60/1.1	1.60/1.90 1.60/1.90 1.60/1.90 1.60/1.90 1.60/1.90	90 .040 90 .040 90 .040	.040 .040 .040 .040 .040	.20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35			********	.10c .10 .10 .10	2.00			
NE 8613 NE 8615 NE 8617 NE 8620 NE 8630 NE 8635 NE 8637 NE 8640 NE 8642 NE 8645 NE 8650	.12/ .17 .13/ .18 .15/ .20 .18/ .23 .28/ .33 .33/ .38 .35/ .40 .38/ .43 .40/ .45 .43/ .48 .48/ .53	.70/ .90 .70/ .90 .70/ .90 .70/ .90 .70/ .90 .75/1.00 .75/1.00 .75/1.00 .75/1.00 .75/1.00	.040 .040 .040 .040 .040 .040 .040 .040	.040 .040 .040 .040 .040 .040 .040 .040	.20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70	.15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25	.75 .75 .75 .75 .75 .75 .75 .75 .75 .75	15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00	1.25c 1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	\$25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255 NE 9260 NE 9261 NE 9262	.50/ .60 .55/ .65 .55/ .65 .55/ .65	.70/ .95 .70/1.00 .70/1.00 .70/1.00	.040 .040 .040 .040	.040 .040 .040 .040	1.80/2,20 1.80/2,20 1.80/2,20 1.80/2,20	.10/ .25			.40	8.00 8.00 13.00 13.00		
NE 9415 NE 9420 NE 9425 NE 9430 NE 9435 NE 9437 NE 9449 NE 9442 NE 9445 NE 9450	.13/ .18 .18/ .23 .20/ .25 .23/ .28 .28/ .33/ .38 .35/ .40 .38/ .43 .40/ .45 .43/ .48	.80/1.10 .80/1.10 .80/1.10 .80/1.10 .90/1.20 .90/1.20 .90/1.20 .90/1.20 1.00/1.30 1.00/1.30	.040 .040 .040 .040 .040 .040 .040	.040 .040 .040 .040 .040 .040 .040 .040	.20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35	.30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50 .30/ .50	.30/ .60 .30/ .60 .30/ .60 .30/ .60 .30/ .60 .30/ .60 .30/ .60 .30/ .60 .30/ .60	.08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15	.75 .75 .75 .75 .75 .75 .75 .75 .80 .80	15.00 15.00 15.00 15.00 15.00 15.00 15.00 16.00 16.00	1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	25.00 25.00 25.00 25.00 25.00 25.00 26.00 26.00 26.00
NE 9537° NE 9540° NE 9542° NE 9545° NE 9550°	.35/ .40 .38/ .43 .40/ .45 .43/ .48 .48/ .53	1.20/1.50 1.20/1.50 1.20/1.50	.040 .040 .040	.040 .040 .040 .040 .040	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70	.15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25	1.20 1.20 1.20 1.20 1.20	24.00 24.00 24.00 24.00 24.00	1.70 1.70 1.70 1.70 1.70	34.00 34.00 34.00 34.00 34.00

*Recommended for large sections only. Note: The extras shown are in addition to a base price of 2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, \$5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.

Base Quantities

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Standard unless otherwise keyed on

Standard unless otherwise keyed on prices.

HOT ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD ROLLED: Sheets, 400 to 1499 lb.; strip, extras on all quantities; bars, 1500 lb. base; NE ailoy bars, 1000 to 39,999 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 1999 lb (7) 400 to 1999 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb. and over. (15) 1000 lb. and over. (16) 1500 lb. and over (17) 2000 lb. and over. (18) 3500 lb. and over (*) Philadelphia: Galvanized sheets, 25 comore bundles.

Extra for size, quality, etc., apply on above quotations.

quotations.
*Add 0.271c. for sizes not rolled in Birming-

***Add U.211c for shall ham.

***City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered

	Lower Lake I	-01.68-)
		Per Gross Ton
Old ra	inge, bessemer, 5	1.50 \$4.75
Old ra	nge, non-besseme	r. 51.50 4.60
	a, bessemer, 51.50	
	a, non-bessemer,	
High I	phosphorus, 51.50	4.35
*Adi	ustments are m	ade to indicate
	based on variance	
of ores	s as analyzed on	a dry basis by
	ndent laboratories	
macpe	ident laboratories	10

FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Exception

When the WPB Steel Division certifies in writing the consumer's need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effecti	ve CaF ₂ Conte	nt:	Base	shor	
70% 0	r more			\$3	33.00
	ut less than 70				
	ut less than 65				
Less t	han 60%				30.00

Information Free

(1) Fasteners:

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16-page booklet describes and illustrates the quarter-turn Simlok fastener which quickly fastens and unfastens two sheets of metal or plywood. Among the features are the standard stud which is self-ejecting when unlocked, case hardened threaded receptacle, safety ring, splines for locking receptacle in desired position, and the lock ring for permanent installation. Simlok Div. of Simmons Machine Tool Corp.

(2) Safety Goggles:

Folder describes the Willson Mono-Goggle which has a single large crystal-clear plastic lens for full vision. Light weight 1½ ounces, comfortable, has passed tests for impact, distortion light transmission. Available for im-mediate delivery in ventilated and non-ventilated types. Willson Products, Inc.

(3) Cold Headed Fasteners:

Booklet shows machine screws, nuts, bolts, etc., and gives thread size data, tables of weights per 1000 pieces, and prices. Special heads, threads and finishes on fastenings of any metal adapted to cold upset is this company's specialty. Weekly output 25,000,000. Progressive Mfg. Co.

M/g. Co.

(4) Roller Bearing Data:

Engineering data book, built for designing engineers, gives the answer to heavy duty bearing installations. It shows all dimensions, capacities and tolerances and illustrates many typical installations of Staggered Roller Bearings. Orange Roller Bearing Co., Inc.

(5) Furnace Wall Coatings:

Folder tells why Armor-Clad Coatings increase furnace wall life 50% to 300% in metallurgical furnaces, power and heating boilers. Composed of high temperature-resisting clays and minerals, and mixed with competent colloids and carriers, Armor-Clad Coatings seal the pores and joints, prevent spalling, resist slag adhesion. For temperatures from 1500°F. to 3800°F. Armor-Clad Company. pany.

(6) Corrosion Prevention:

Attractively illustrated 60-page book-let discusses Anodizing, Chromatizing and Phosphatizing for preventing corro-sion on aluminum surfaces and enabling them to bond firmly with paint. It also gives engineering drawings of the re-quired equipment, basic formulae, test methods and government specifications. Turco Products, Inc.

(7) Precision Measuring Tools:

A 144-page book which is both a catalog and a handbook describes many

precision measuring tools made by this company, and presents engineering data and tables relative to making precision measurements. Includes light wave quipment, optical fiats, light wave micrometers, gage blocks, master blocks, plug gages, measuring rolls, measuring wires, laps, etc. A valuable book dedicated to those who require precision measurements. Van Keuren Co.

(8) Rolling Mills:

Booklet describes heavy duty and medium light rolling mills for finishing ferrous and non-ferrous strip accurately to thin gauge—for breaking down alloy ingots—for high speed sizing of colled strip high carbon steel and non-ferrous alloys—for grading and form rolling—for wire flattening. Grooved rolls can be used for reduction of rods. Standard Machinery Co.

(9) Moulding Machines:

This series of bulletins describe and illustrate a complete line of moulding machines such as: jolt squeezers, arm and car type jolt squeezing strippers, jolt squeeze rollover draw and pin strippers, jolt pin lifters and plain jolt moulding machines. Milwaukee Foundry Equipment Co.

(10) Aircraft Rivets:

This booklet features aircraft rivet net price lists for aluminum alloy rivets, steel, iron and monel metal rivets, and emphasizes the quality and ready availability of this precision product. Milford Rivet & Machine Co.

(11) Milling Cutters:

Catalog 44 is divided into four sections—adjustable hollow mills for cutting steel; hollow mills for cutting steel; hollow mills for cutting cast iron and non-ferrous metals; facing and counterboring tools, and special production tools. Genesee Mfg. Co., Inc.

(12) Plaster Mold:

How plaster can be the ideal molding material is shown in this booklet which narrates the history of plaster as a casting investment. It tells the Capaco casting process, the mixtures used and explains the entire operation, stressing the many benefits. Briggs Mfg. Co.

(13) Vapor Degreasers:

A patented degreasing process for the cleaning of parts of all metals and alloys, rendering them chemically clean in a few seconds and giving 100 per cent grease-free surfaces. It employs such methods as emulsion, saponification and electrolytic cleaning. G. S. Blakeslee & Co.

(14) Induction Heating:

A complete summary of facts of induction heat-treating process is outlined in this booklet. The process is applicable to the heat-treatment of both irons and steels and the treated zones acquire maximum wearing qualities. The booklet also tells how the process is applied. Budd Induction Heating, Inc.

(15) Graphitic Steel:

This is the eighth printing of the graphitic booklet and contains added data and new typographical improvements. Information is given in detail on Graph-Mo, Graph-Tung, Graph-Al, Graph-M.N.S., and Graph-SIL. It also contains drawings of applications and grinding wheel specifications. Timken Roller Bearing Co., Steel & Tubes Div.

(16) Tap Extractors:

Leaflet contains price list of six standard sets of tap extractors giving a wide range of sizes, and it explains the three simple steps taken for removing broken taps. The simplicity of operation, immediate delivery and 48-hr. free reconditioning service is also emphasized. The Walton Co.

(17) Searchray:

New four-page folder tells how the Searchray 150 unit works and lists its advantages and applications. This unit provides a quick, accurate means for non-destructive examination of specimens for internal flaws, cracks or foreign matter which is inexpensive to install and easy to operate. North American Philips Co., Inc.

(18) Fasteners:

36 pages of information and illustrations on the installation, testing, specifications and applications of Esna Spring-Lock Fasteners. This fastener is locked by an 85° turn of the stud cam, and is the result of more than ten years of research development. For quick fastening and unfastening of sheet metal parts, light plates and plywood. Elastic Stop Nut Corp. of America.

(19) Safety Goggles:

12-page booklet describes and gives specifications of Welsh safety goggles for chippers, welders, etc. The lenses are a special composition of superior optical glass hardened so that they exceed Federal requirements on impact resistance by 100%. The welding lenses are optically ground and polished to give protection from infra-red and ultraviolet rays. Available in several types. Welsh Mfg. Co.

NOTICE TO READERS: Your request for this information will be forwarded promptly to the manufacturer issuing the literature. The offer is good for only two months.

6/29/44

THE IRON AGE, New York 17, N. Y.

Send the free booklets circled below:

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COMPANY.....

CO. ADDRESS CITY..... STATE.....

CARD MUST BE COMPLETELY FILLED OUT

FIRST CLASS PERMIT No. 36 (Sec. 510 P. L. & R.) New York, N. Y.

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INFORMATION FREE (Continued)

(20) Hard Chromium Plating:

Folder describes the advantages and names some applications of hard chromium plating for prolonging the life and salvaging tools, dies, gages and machine parts. This company mentions its deep freezing and temperature control equipment necessary when plating gages. The folder makes a free offer to hard chromium plate your samples. Middle-sex Gage & Tool Corp.

(21) Milling Machines:

Two booklets on milling machines: One features the G type machine and attachments designed for both tool room and light production; the other describes the Maximiller machines and attachments, constructed with flexible and operating convenience. There are many photographs of the smith Machine Co.

(22) Pitch Hobbs:

The information in this book will give a better understanding to the problems of producing and using hobbs to provide the utmost in accuracy and production. It features the general characteristics, precautions to be taken and many important suggestions. Barber-Colman Co.

(23) Adjustable-Speed Drive:

Two informative booklets on the application of adjustable speed drives to machine tools, complete with diagrams, illustrations and illuminating text, explain the advantages this conversion offers. Reliance Electric & Engineering

(24) Grinding Machine:

Leaflet gives specifications of a haud-operated grinder with power-operated advantages. The special features of the grinder are the micrometer adjustments on the vertical spindle and cross feed. Mechanical Engineering Co.

(25) Heat Exchanger:

The Niagara Aero Heat Exchanger assures trustworthy operation and uniform production from all equipment requiring fluid cooling. Folder claims constant production and quality from any process; steady, reliable operation from any equipment; lower cost for more dependable cooling; and a maintenance of uniform temperature of fluids for any process. Niagara Blower Co.

(26) Ovens:

Bulletin 71-T illustrates and describes a complete line of electrically heated ovens, developed in standard sizes and ratings, which have been found practical to set-up for economy and uniformity. The ovens are furnished as a complete unit including all controls. Heating elements are used in all Trent equipment. Harold E. Trent Co.

(27) Tool Repair:

Easy-Flo is the low temperature brazing alloy that repairs broken cutting tools with speed, reliability and economy and makes joints of remarkable strength that are virtually indestructible. Details of the Easy-Flo brazing method are given in this folder and also examples of its actual application to a varity of tools. Handy & Harman.

(28) Pickling:

Technical service data folder on Rodine as a standard control for the pickling bath, which process revolutionized pickling of steel, has been responsible for saving vast quantities of metal since its introduction. This method saves needless waste of pickling acid. American Chemical Paint Co.

(29) Press Operation:

Bulletin 4400 explains in detail the H-P-M closed circuit fastraverse system of hydraulic press operation. It will prove quite enlightning to all those who are interested in the modern applications of hydraulics to self-contained, high speed production equipment. Hydraulic Press Mfg. Co.

(30) Rolling Doors:

The many advantages that rolling doors afford to buildings of all classes giving economy and efficiency are described in this booklet. The Kinnear doors, besides the convenience of low cost of maintenance and reliability of manufacture, meet all nine major requirements that a door must meet in actual operation. The requirements are fully described and illustrated, plus many other illustrations of the different types of doors. The Kinnear Mfg. Co.

(31) Forge Furnaces:

Surface combustion production forge furnaces meet every demand for speed, uniformity and low scale loss. These furnaces are built in two main types: The slot forge used for heating the ends only of the stock; and the oven forge or billet heater designed to heat the stock all over. Both of these are described and illustrated in this folder. Surface Combustion.

(32) Cutting Tools:

Many carbide-tipped cutting tools generally classified as special are now listed as standard in the new Catalog No. 144. This catalog has expanded to 48 pages as a result of the addition of engineering data and the re-designing of many other tools, including spiral reamers, jobber reamers, straight shank end mills, side milling cutters and many others. Wendt-Sonis Co.

(33) Dust Collectors:

56-page book shows innumerable installations of dust collecting units and systems, spray booths and equipment, ovens and ventilating and completely engineered air processing systems. It includes detailed specifications of Hydro-Whirl dust collectors and spray booth units together with engineering data of immeasurable value of those with air handling problems. Peters-Dalton, Inc.

(34) Aircraft Socket Bolts:

Shown in this catalog are the complete NASC Standards for internal wrenching bolts. Also are illustrations and specifications of various designs of bolts used in aircraft assembly—Holobolts used in aircraft assembly—Holo-Krome quality and precision throughout. The Holo-Krome Screw Corp.

(35) Electric & Air Tools:

Two booklets—one emphasing the great improvements in modern air tools

which have occurred in the last two to three years and stressing the speed under load, power and weight of these tools; the other booklet explains how high cycle portable tools meet requirements of portable tool users. Both are profusely illustrated. Rotor Tool Co.

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(36) Rocker-Arm Welder:

This technical bulletin features the new Rocker-Arm Welder designed for making between 500 and 1000 sound spot welds per hr. on structural sections of aluminum. A feature of this machine is the rigidity of the frame, the two ft. controls and the solenoid valves. Progressive Welder Co.

(37) Castings:

Four-page illustrated folder describes a variety of recent applications of Meehanite castings for highly stressed parts, formerly specified as steel or high alloy castings. It gives examples of these highly stressed parts. Meehanite Research Institute.

(38) Welder's Guide:

This is a booklet for the welder to have and use as reference in the use and procedure of hard surfacing. It brings out the most important points and covers various aspects of the matter as fully as possible. Various hard surfacing points are treated individually. Mir-O-Col Alloy Co.

(39) Hydraulic Pumps:

The Racine line of pumps, valves and controls are described and illustrated in this booklet. All pumps, valves and controls are designed around the principle of variable volume delivery, which offers maximum flexibility, greatest simplicity in circuits and the full use of power. Racine Tool and Machine Co.

(40) Air Chucks:

The operation of the Red-E-Air Chuck is related in this folder. It is an ideal tool for holding parts for drilling, milling, slotting, burring, boring, etc., and can be used on many different jobs by merely changing collet and stop. It saves valuable production metals and materials. Redmer Air Devices Corp.

(41) Motors:

The brochure "Out of Thin Air" tells something of the story of strides made in the design of fractional horsepower motors since the beginning of the war. These new motors incorporate safety and protective devices, versatility, controllability and durability which will be important postwar factors. The Dumore Co.

(42) Rayotube Pyrometers:

48-page catalog contains basically the same engineering descriptions as were presented in the 1941 publication but contains for the first time equipment being used to measure the temperature of molten cast iron, electric salt pots and blast furnace stove domes. It shows how war plants have been applying rayotubes and micromax equipment to important new temperature-measuring jobs. Leeds & Northrup Co.

6/29/44

THE IRON AGE, New York 17, N. Y.

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SEMI-FINISHED STEEL

Ingots, Carbon, Rerolling

Base per gross ton, f.o.b. mill... \$31.00
Exceptions: Phoenix Iron Co. may
charge \$38.75; Kaiser Co., \$43.00 f.o.b.
Pacific Coast
Ports; Empire Sheet &
Tinplate Co., \$34.25.

Ingots, Alloy
Base per gross ton, f.o.b. Bethlehem, Buffalo, Canton, Coatesville, Chicago, Massillon, Pittsburgh

Exceptions: C/L delivered Detroit add \$2.00; delivered East Michigan add \$3.00. Connors Steel Co. may charge \$45.00 f.o.b. Birmingham.

Alloy Billets, Blooms, Slabs
Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton 54.00
Price delivered Detroit \$2.00 higher;
E. Michigan \$3.00 higher.

Shell Steel

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point. Open hearth or bessemer \$34.00

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.
Per Lb.
Grooved, universal and sheared . 1.90c.

Wire Rods
(No. 5 to 9/32 in.)

	(NO.	9	to	9	1	52	8	72.)		p	er Lb.
Pittsburgh,	Chi	cag	50,	(CI	ev	e	lar	nd			2.00c.
Worcester,	Mas	S.										2.10c.
Birminghan San Franc	n				* -		. *					2.00C.
Galveston	1500											2.25c.
9/32 in.	to 47	/6	4 1	n.		0.	15	ic.	8	ı	lb.	high-
er. Quanti	ty ex	tra	38	a	pr	13	7.					

TOOL STEEL

(F.o.b. Pittsburgh, Beth	lehem,	Syracuse)
771 .	E	Base per 1b.
High speed		67c
straight molybdenum		540
Tungsten-molyhdenum		57160
nign-carbon-chromium		. 430
VII hardening		240
opecial carbon		22c
Extra carbon		18c
Regular carbon		14c
Warehouse prices eas	st of	Mississipp
are 2c. a lb. higher: we	est of	Mississippi



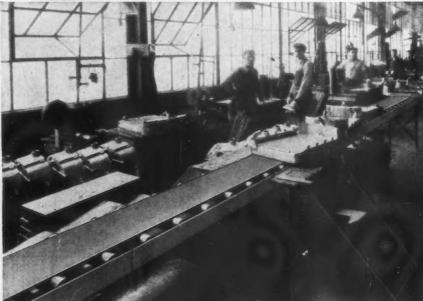
with many years of experience by a most responsible company. You receive continuous "followthrough" by Detrex service engineers for the entire life of the equipment.

May we send you full information on Detrex machines and cleaning chemicals?

DETREX CORPORATION

13015 HILLVIEW AVENUE DETROIT 27, MICHIGAN YOUR PURCHASE OF WAR BONDS SAVES LIVES





BELT CONVEYORS may be the Answer .. Ask STANDARD CONVEYOR!

M ANUAL handling is costly in time, manpower and space—the less of it you have the lower your costs in manufacturing, processing or storage handling.

Investigate conveyors - belt conveyors for example. Belt conveyors are amazingly versatile. They handle small packages as easily as bulky crates - articles need not have a smooth bottom or surface as they do not "roll" but ride the belt. The belt itself may be stitched canvas, rubber, white woven, wire mesh or steel.

Speed of travel can be controlled to a few feet or a hundred per minute. Conveyors can be inclined, declined, horizontal or a combination of all three and equipped with transfer and elevating arrangements. A single unit of belt conveyor can be made longer than any other type of power conveyor. The range of application is practically

We suggest you look into all the things belt conveyors can do—the many ways they can earn money for you.

Standard Conveyor makes power and gravity conveyors in belt, roller, chain, and slat types; spiral chutes, in-clined elevators, tiering machines, portable pilers, pneumatic tube systems. Write for Standard's valuable reference book IA-64 on conveyors and conveying methods.

STANDARD CONVEYOR CO.

General Offices: North St. Paul 9, Minn. Sales and Service in Principal Cities





TIERING AND LIFTING MACHINES



PORTABLE PILERS



SPIRAL CHUTES



PNEUMATIC

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh Distriction and Lorain, Ohio, Mill. (F.o.b. Pittsburgh only on wrought pipe Base Price—\$200.00 per Net Ton

To

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N

S

Steel	(Butt	Weld)

1/6 in.

34 in 1 to 3 in.				55 574
Wrought	Iron	(Butt 1	Veld)	
½ in ¾ in			24	34
3/4 in			30	10
1 and 11/4	in		. 34	16
1½ in			38	184
1 ½ in			371/2	18
Steel (La	p Wel	ld)		

2 in. 61 2 1/4 and 3 in. 64

3 1/2 to	6 in	66	54%
Wroug	the Iron	(Lap Weld)	
2 in.		30 1/2	12
21/2 to	3 1/2 in.	31 1/2	144
4 in.		331/2	18
4 1/2 to	8 in	32 1/2	17

Steel (Butt, extra strong, plain ends, 61 ½ 65 ½

Wrought Iron (Same as Above)

PF 1	Uug	886	# B	UII	- (2	14 8	861		84	.0	AUUUU	
1/2	in.											25	6
3/4	in.											31	12
1 1	to 2	in.				٠.		* *	×			38	194
													- 11

Steel (Lap, extra strong, plain ends)

Wrought Iron (Same as Above)

		-				-						331/2	15%
				in.								39	221/2
4	1/2	to	6	in.				*	×			371/2	21

CAST IRON WATER PIPE

Per Net Tos
6-in. and larger, del'd Chicago...\$54.84
6-in. and larger, del'd New York...\$52.86
6-in. and larger, Birmingham ... 46.06
6-in. and larger f.o.b. cars, San
Francisco or Los Angeles 69.44
6-in. and larger f.o.b. cars, Seattle. 71.20
Class "A" and gas pipe, \$3 extra; 4-in
pipe is \$3 a ton above 6-in. Prices shown
are for lots of less than 200 tons. For
200 tons or over, 6-in. and larger are
\$45 at Birmingham and \$53.80 delivered
Chicago, \$59.40 at San Francisco and
Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per
cent tax on freight rates.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive "lubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

								Lap
						Sean	nless	Weld
						Cold	Hot	Hot
					1	Drawn	Rolled	Rolled
2	in.	o.d.	13	B.W.	G.	15.03	13.04	12.3
21/6	in.	o.d.	12	B.W.	G.	20.21	17.54	16.58
3	in.	o.d.	12	B.W.	G.	22.48	19.50	18.3
3 1/6							24.62	
4							30.54	28.6
(Ext	ras	for	less	ca	rload	quantit	ies)

40,000 30,000 20,000 10,000 5,000

WIRE PRODUCTS

BING

h Distric

ught pipe

Galu

49½ 52½ 54½

12

12 194 in ends)

481 524 56

15 ½ 22 ½ 21

steel pipe f 5%. On rices are 30% and base card

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r Net Ton ...\$54.80 ...\$2.20 ...46.00

69.40 le. 71.20 tra; 4-in.

es shown ons. For rger are delivered isco and ttle. De-w 3 per

mmercial Tubes, per 100 d lots.

t Hot ed Rolled 12.38 14.16.58 18.35 223.15

tities)
...Base
ft. 5%
ft. 10%
ft. 20%
ft. 30%
ft. 45%
...65%

23.15 28.66

IPE

San

in ends) 501 541 57

e)

6 e) To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named Base p	Pointst
Standard wire nails Coated nails Cut nails, carloads Annealed fence wire Annealed galv. fence wire	2.55 3.85 Base per \$3.05	\$3.05 3.05 100 Lb. \$3.55 3.90
Woven wire fence* Fence posts, carloads Single loop bale ties Galvanized barbed wire** Twisted barbless wire	\$0.67 .69 .59 .70	0lumn \$0.85 .86 .84 .80

*15½ gage and heavier. **On 80-rod spools in carload quantities. †Prices subject to switching or transportation charges.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birming-ham or Chicago)

Machine and Carriage Bolts:

Base discount less case lots

	Per Cent Off List
1/2 in. & smaller x 6 in.	& shorter 65 1/2
9/16 & % in. x 6 in. &	shorter 63 1/2
34 to 1 in. x 6 in. & sho	
11/4 in, and larger, all le	ngths59
All diameters over 6 in.	
Lag, all sizes	
Plow bolts	

Nuts, Cold Punched or Hot Pressed: (Hexagon or Square)

1/2 in	n. ar	id s	sma	ller					 	×	*		. 62	2
9/16	to	1 i	n.	inclu	si	ve							.59)
11/4	to 1	1/2	in.	incl	us	iv	e		 				.57	1
1 5/8	in. a	ind	laı	rger	*								.56	5

1% in and larger
On above bolts and nuts. excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts U.	S.S.	S.A.E.
Base discount less keg	lots	
7/16 in. and smaller		64
½ in. and smaller	62	
in. through 1 in		60
	59	58
11/4 in. through 11/2 in	57	58
1% in. and larger	56	

In full keg lots, 10 per cent additional discount.

Stove Bolts	Consumer	
Packages, nuts loose	.71 and 10)
In packages, with nuts attack	hed 71	
In bulk	80)
On stove bolts freight all	owed up to)
65c per 100 lb. based on Cle	veland, Chi-	N.
cago, New York on lots of 200	10. or over	

Large Rivets (1/2 in. and larger)

-		Base	per 100 lb.
F.o.b.	Pittsburgh,	Cleveland,	Chi-
cago,	Birmingha	m	\$3.75

Small Rivets

(7/16 in. and smaller)

		Per Cent Off List
F.o.b.	Pittsburgh.	Cleveland, Chi-
cago,	Birminghan	m

Cap and Set Screws

Upset	full fir	hexag	on head	cap
scre	ws, coars	se or fine	thread.	up to
and	incl. 1 i	n. x 6 1	n	64
Upset	set screv	vs, cup s	and oval	points 71
Milled	studs .			46
Flat h	ead cap	screws,	listed size	s 36
Filliste	er head	cap, liste	d sizes .	51
Frei	ght allow	ved up to	o 65c pe	r 100 lb.
based	on Clevel	land, Chi	cago or N	lew York
on lots	of 200	lb. or or	ver.	

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

				2	0x14 in.	20x28 in.
8-lb.	coating	I.C.			\$6.00	\$12.00
15-lb.	coating	I.C.			7.00	14 00
20-lb.	coating	I.C.			7.50	15.00

FOR any SPEED OR SERVICE TYPE DSM TYPE CM BACKLASH, FRICTION, WEAR AND CROSS-PULL ...the 4 destructive evils found in all other types and makes of couplings. NO BACKLASH NO WEAR NO LUBRICATION NO THRUST FREE END FLOAT These are the five essential features of

Thomas Flexible Couplings that insure a permanent care-free installation.





WRITE FOR COMPLETE ENGINEERING CATALOG

HIGH SPEED HEAVY DUTY FLOATING SHAFT TYPE FLEXIBLE COUPLING



THE THOMAS PRINCIPLE ELIMINATES CHAINS, SPUR GEARS and other VIBRATING MAKESHIFTS

COUPLING

REN, PENNSYL

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations be gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos-	Charcoal
Boeton,	\$25.50	\$25.00	\$26.50	\$26.00		
Brooklyn	27.50	27.00		28.00	***	
lersey City	26.53	26.03	27.53	27.03		*****
Philadelphia (4)	25.84	25.34	26.84	26.34	\$30.74	
Bethlehem, Pa.	25.00	24.50	26.00	25.50	****	
Everett, Mass	25.00	24.50	26.00	25.50		
Swedeland, Pa	25.00	24.50	26.00	25 50	00.00	
Steelton, Pa	00 00	24.50	00 00	05.40	29.50	
Birdsboro, Pa. (3)	25.00 25.00	24.50	26.00	25.50	29.50	4.4.6
		24.50	25 00	24 80		
	24 00 24 00	23.50	25.00 24.50	24 50		
Neville Island, Pa	24 00	23.50	24.50	24.00		
Sharpsville, Pa. (1)	24 00	23 00	25.00	24.50	29.50	
94 - 4 - 41 O	25.11	24.61	25.00	25.11	29.30	11.080
0	25 39	24.89	25.89	25.39	32.69	
	25.94	25.44	26.44	25.94	32.86	
Mansfield, Onio	24.50	24.50	20.00		32.00	****
Chicago	24.00	23.50	24.50	24.00	35 46	\$37.34
Granite City, III.	24.00	23.50	24.50	24.00	35 40	
Cleveland	24.00	23.50	24.50	24.00	32.42	
Hamilton, Ohio	24.00	23.50	64.00	24.00	30.40	
Toledo	24.00	23.50	24.50	24.00		*****
Youngstown	24.00	23.50	24.50	24.00	32.42	
Detroit	24.00	23.50	24.50	24.00		
Lake Superior fc.	24.00	20.00	21140			34.0C
Lyles, Tenn. fc. (2)						33.00
St. Paul	26,63	26.13	27.13	26,63	39.80	
Duluth	24.50	24.00	25.00	24.50		
Birmingham	20.38	19.00	25.00	1		
Los Angeles	26.95				1	
San Francisco	26.95					
Seattle	26.95					
Provo. Utah	22.00	21.50		l can		
Montreal	27.50	27.50		28.00		
Toronto	25.50	25.50		26.00		

(1) Pittsburgh Coke & Iron Co (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers. Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable. Struthers Iron and Steel 'Co. may add another \$1.00 per gross ton for iron from Struthers, Ohio, plant.

Fire Supe First

First Sec. Seco No. Grou Silic Pent Chic Silic Chric

Stan Pl Mag Stan Cher

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Star N Ang (F.c Ligh

Cut Scre Tie Tie

Tra Tra Tra B Chic

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F.B Ban Pla She Hot Col

Ch

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Dom (i

- (2) Price shown is for low-phosphorous iron; high phosphorous sells for \$28.50 at the furnace.
- (3) E. & G. Brooke Co. Birdsboro, Pa., permitted to charge \$1.00 per ton extra.
- (4) Pittsburgh Ferromanganese Co (Chester furnace only) may charge \$2.25 a ton over maximum basing point prices

Basing point prices are subject to switching charges; Silicon differentials (not to exceed 50c, a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 to 2.25 per cent); Phosphorus differentials, a reduction of 38c, per ton for phosphorus content of 0.70 per cent and over; Manganess differentials, a charge not to exceed 50c, per ton for each 0.50 per cent manganess content in excess of 1.00 per cent. Effective March 3, 1943, \$2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and \$1 per ton extra for each additional 0.25 per cent nickel.

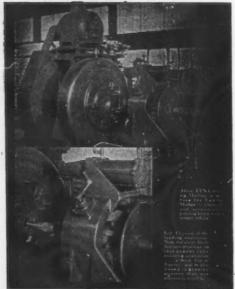
ETNA

A client of ours had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so they did the safe and logical thing—they put their swaging job up to Etna.

The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points *more* copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from $\frac{9}{6}$ " to 4" and the experience to help you get the most out of this type of machine.





ETNA

METAL POWDERS

METAL POWDERS
Prices are based on current market
prices of ingots plus a fixed figure. F.o.b.
shipping point, c. per lb., ton lots.
Copper, electrolytic, 150 and 200
mesh
Copper, reduced, 150 and 200
mesh
mesh, 96 + % Fe13½ to 15c.
Iron, crushed, 200 mesh and finer,
90 + % Fe 40
90 + % Fe
and finer, 98 1/2 + % Fe 630.
Iron, electrolytic, unannealed, 300
mesh and coarser, 99 + % Fe. 30 to 33c.
Iron, electrolytic, annealed minus
100 mesh, 99 + % Fe 42c.
Iron, carbonyl, 300 mesh and finer, 98-99.8 + % Fe 90c.
Aluminum, 100 and 200 mesh. *23 to 27c.
Antimony, 100 mesh 20.6c.
Cadmium, 100 mesh \$1
Chromium, 150 mesh \$1.03
Lead, 100, 200 & 300 mesh, 11 1/4 to 12 1/4 c.
Manganese, 150 mesh 51c.
Nickel, 150 mesh 51 %c.
Solder powder, 100 mesh, 8 1/2 c. plus metal
Tin, 100 mesh 58%c.
Tungsten metal powder, 98%- 99%, any quantity, per lb \$2.60
Molybdenum power, 99%, in 200-
lb. kegs, f.o.b. York, Pa., per lb. \$2.60
Under 100 lb \$3.00

*Freight allowed east of Mississippi.

COKE
Furnace, bechive (f.o.b. oven) Net Ton Connellsville, Pa
Foundry, beehive (f.o.b. oven) Fayette Co., W. Va 8.10
Connellsville, Pa 8.25
Foundry, By-Product
Chicago, del'd
Chicago, f.o.b
Kearny, N. J., f.o.b 12.65
Philadelphia, del'd 12.88 Buffalo, del'd 13.00
Portsmouth, Ohio, f.o.b 11.10
Painesville, Ohio, f.o.b 11.75
Erie, del'd
Cincinnati, del'd
St. Louis, del'd 13.85
Birmingham, del'd 10.50
 Hand drawn ovens using trucked cospermitted to charge \$7.75 per ton plu
transportation charges. **Mo., Ala., and Tenn. producers—\$13.35.

REFRACTORIES (F.o.b. Works)

Co

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Pa.,

Co. \$2.25 rices.

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nickel each

23 1/20. 25 1/20. o 15e. 40. 630.

to 33c.

420.

90c. to 27c. 20.6c. \$1.03 12½c. 51c. 51½c. s metal 58%c.

\$2.60

sippi.

Net Ton \$7.00°

8.10

13.35 12.60 14.25 12.65 12.85 13.00 11.10 11.75 12.75 12.80 12.80 13.85 10.50 ed coal on plus

(F.O.O. WOLKS)
Fire Clay Brick Super-duty brick, St. Louis
Silica Brick Pennsylvania and Birmingham\$51.30 Chicago District
Chrome Brick Per Net Ton Standard chemically bonded, Balt., Plymouth Meeting, Chester\$54.00
Magnesite Brick Standard, Balt. and Chester 376.00 Chemically bonded, Baltimore 65.00
Grain Magnesite Domestic, f.o.b. Balt. and Chester in sacks (carloads)

RAILS, TRACK SUPPLIES

(F.o.b. Mill)
Standard rails, heavier than 60 lb., No. 1 O.H., gross ton \$40.00 Angle splice bars, 100 lb. 2.70 (F.o.b. Basing Points) Per Gross Ton Light rails (from billets) \$40.00 Light rails (from rail steel) 39.00
Base per I.b.
Cut spikes 3,09c. Screw spikes 5,15c. Tie plates, steel 2,15c. Tie plates, Pacific Coast 2,30c. Track bolts 4,75c. Track bolts, heat treated, to rail-
roads 5.00c.
Track bolts, jobbers discount 63-5 Basing points, light ralls, Pittsburgh.
Chicago, Birmingham; cut spikes and tie
plates-Pittsburgh, Chicago, Portsmouth,
Ohio, Weirton, W. Va., St. Louis, Kansas
City, Minnequa, Colo., Birmingham and
Pacific Coast ports; tie plates alone-
Steelton, Pa., Buffalo. Cut spikes alone-
Youngstown, Lebanon, Pa., Richmond,
Oregon and Washington ports, add 25c.

CORROSION AND HEAT-RESISTING STEEL

Per lb. base price, f.o.b.	Pittsburgh)
Chromium-Nickel Alloys	
	o. 304 No. 302
Forging billets21	.25c. 20.40c.
Bars	.00c. 24.00c.
Plates 29	.00c. 27.00c.
Structural shapes 25	.00c. 24.00c.
Sheets	.00c. 34.00c.
Hot rolled strip23	3.50c. 21.50c.
Cold rolled strip 30).00c. 28.00c.
Drawn wire 25	5.00c. 24.00c.
Straight-Chromium Alloy	8
No. 410 No. 430 N	No. 442 No. 446
F.Billets 15.725c. 16.15c. 19	9.125c. 23.375c.
Bars 18.50c. 19.00c. 2	2.50c. 27.50c.

Cold st	rip22.00c.	22.50c.	32.00c.	52.00c.
Chron	ium-Nicl	kel Clad	Steel (20%) No. 304
Plates Sheets				.18.00c.*
	ludes ann			.19.00c.

ELECTRICAL SHEETS

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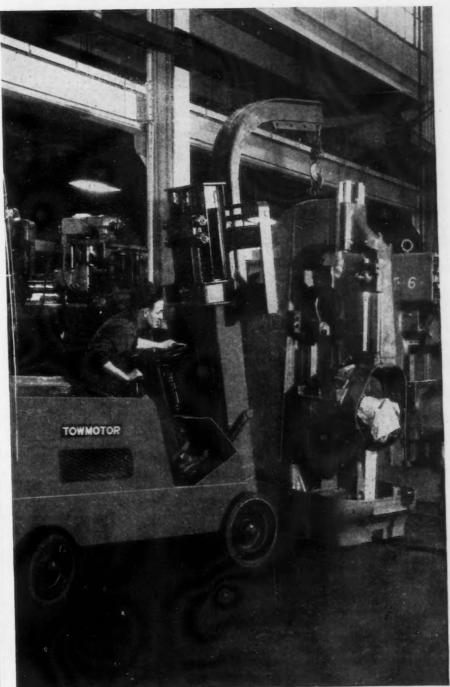


PHOTO BY LANDESMAN. CLEVELAND HOBBING MACHINE CO.

anufactured goods are in actual production only 35% to 40% of total processing time; handling operations require the remainder. Time is saved, production is speeded by the application of modern handling methods .

such as



TOWMOTOR CORPORATION . 1230 E. 152 NO STREET, CLEVELAND 10, OHIO STRAIGHT-GAS POWERED INDUSTRIAL TRUCKS EXCLUSIVELY-SINCE 1919

Othe

Ferre lur Lo Ne Yo tur

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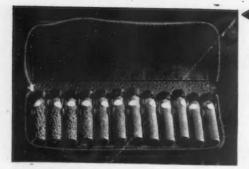
Moly 52

pe Moly La pe Zire

Zire

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ba usi



A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our-

We manufacture shot and grit for endurance

Heat-Treated Steel Shot and **Heat-Treated Steel Grit**

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

HARRISON ABRASIVE CORPORATION

Manchester, New Hampshire

HEAT-TREATED STEEL GRIT



PRECISION WORK ON SMALL PARTS

(up to 20 lbs.)

Induction heat-treating (30 KW) External Grinding (up to 10" x 36") Internal Grinding Surface Grinding (plain and rotary) Milling-vertical, horizontal, contour Duplicating Automatic lathe work Etc.

For list of equipment, pictures and other information concerning plant write

GENERAL REFINERIES,

27 NORTH 4TH STREET, MINNEAPOLIS I, MINNESOTA

Ferromanganese
78-82% Mn, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Bethlehem, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.
Carload lots (bulk)\$135.00
Carload lots (packed)141.00
Less ton lots (packed)148.50
Premium, \$1.70 for each 1% above \$2%
Mn; penalty, \$1.70 for each 1% below 78%. Carload, bulk 38c.
1.c.l. lots 38c.
95-97% Mn, 2% max. C, 1.5% max. Si,
2.5% max. Fe.
Carload, bulk 34c.
L.c.l. lots 35c. Electric Ferrosilicon
OPA maximum base price cents per lb
contained Si, lump size in carlots, 1.o.b. Si, lump size in carlots, f.o.b. point with freight allowed to destination. Central Western Zone Zone 7.10c. 7.25c. 8.20c. 8.75c. Eastern Zone 6.65c. 8.05c. 75% Si . . 8.05c. 8.20c. 8.75c. 80-90% Si . 8.90c. 9.05c. 9.55c. 90-95% Si . 11.05c. 11.20c. 11.65c. Spot sales add: .45c. per lb. for 50% Si, .3c. per lb. or 75% Si .25c. per lb. for 80-90% and 90-95% Si. Silvery Iron
(Per Gross Ton, base 6.00 to 6.50 St)
F.o.b. Jackson, Ohio\$29.50 ..\$29.50 Buffalo \$29.50°

For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphoros or over.

*OPA price established 6-24-41.

Bessemer Ferrosilicon Bessemer Ferrosilicon
Prices are \$1 a ton above silvery iron quotations of comparable analysis. OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination, for l.c.l. above 2000 lb., packed. Add .25c. for spot sales. Eastern Central Western Zone Zone Zone Zone 27% Si, 2% Fe. 13.10c. 13.55c. 16.50c. 97% Si, 1% Fe. 13.45c. 13.90c. 16.80c. Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% Sl. Add .25c. for spot sales.

Eastern Central Western Zone Zone Zone Zone Carload, bulk 3.35c. 3.50c. 3.65c. 2000 lb.-carload 3.8c. 4.2c. 4.25c.

load ... 3.8c. 4.2c. 4.25c.

Silicomanganese
Contract basis lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Add .25c. for spot sales, 65-70% Mn, 17-20% Si, 1.5% max. C.
Carload, bulk ... 6.70c.
2000 lb. to carload ... 6.70c.
Under 2000 lb. ... 6.90c.
Briquets, contract, basis carlots, bulk freight allowed, per lb. 5.80c.
2000 lb. to carload ... 6.30c.
Less ton lots ... 6.55c Ferrochrome

Ferrochrome
(65-72% Cr, 2% max. St)
OPA maximum base contract prices per
lb. of contained Cr, lump size in carload
lots, f.o.b. shipping point, freight allowed
to destination. Add. 25c. per lb. contained Cr for spot sales.

Eastern Central Western
Zone Zone
0.06% C 23.00c. 23.40c. 24.00c.
0.10% C 22.50c. 22.90c. 23.50c.
0.15% C 22.00c. 22.40c. 23.00c.
0.20% C 21.50c. 21.90c. 22.50c.
0.50% C 21.00c. 21.40c. 22.00c.
1.00% C 20.50c. 20.90c. 21.50c.
2.00% C 21.50c. 21.90c. 21.50c.
2.00% C 21.50c. 20.90c. 21.50c.
2.00% C 21.50c. 20.90c. 21.00c.
66-71% Cr. 0.06% C 0.10% C 0.15% C 0.20% C 0.50% C 1.00% C 2.00% C 66-71% Cr, 13.00c. 13.40c. 14.00c

base b. car lphia, Rock-

135.00 141.00 148.50 82% below

b. of reight x. Si,

36c. 38c. x. Si,

. 34c.

ma. Mn X. Si

f.o.b.

Zone 7.25c. 8.75c. 9.55c. 1.65c. 50% er lb.

Si)
29.50*
30.75*
n add
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iron

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Zone 6.50c. 6.80c.

lb. of with

with proxi-sales. stern one 65c.

25c.

b.

reight

6.05e. 6.70c. 6.90c.

5.80c. 6.30c. 6.55c

es per rload lowed con-

Zone 4.00c. 3.50c. 3.00c.

2.50c 2.00c. 1.50c. 1.00c.

4.00c

lb. b. of pping ation, .25c. Other Ferroalloys
Ferrotungsten, Standard grade,
lump or 'A'X down, packed,
f.o.b. plant at Niagara Falls,
New York, Washington, Pa.,
York, Pa., per lb. contained
tungsten, 10,000 lb. or more...
Ferrovanadium, 35-55%, contract
basis, f.o.b. producer's plant,
usual freight allowances, per
lb. contained Va.
Open Hearth
Crucible
Primos
Cobalt, 97% min., keg packed,
contract basis, f.o.b. producer's
plant, usual freight allowances,
per lb. of cobalt metal
'Vanadium pentoxide, 88%-92%
Vy0s technical grade, contract
basis, any quantity, per lb. contained Vy0s. Spot sales add 5c.
per lb. contained Vy0.
Ferroboron, contract basis, 17.50%
min. Bo, f.o.b. producer's plant
with usual freight allowances,
per lb. of alloy.
2000 lb. to carload
Under 2000 lb.
Silcaz No. 3, contract basis, f.o.b.
producer's plant with usual
freight allowances, per lb. of
alloy. (Pending OPA approval)
Carload lots
2000 lb. to carload
Grainal, f.o.b. Bridgeville, Pa.,
freight allowed 50 lb. and over,
max. based on rate to St. Louis
No. 1
No. 6
No. 79 \$1.90 \$2.70 \$2.80 \$2.90 \$1.50 \$1.10 \$1.20 1.30 25c. 26c. max. based on rate to St. Louis

No. 1

No. 6

No. 79

Bortram, f.ob. Niagara Falls

Ton lots, per lb.

Ferrocolumblum, 50-60%, contract
basis, f.ob. plant with freight
allowances, per lb. contained Cb.

2000 lb. lots

Under 2000 lb. lots

Under 2000 lb. lots

Under 2000 lb. lots

Under 2000 lb. lots

Sterrotitanium, 40%-45%, f.o.b.
0.10c. max. Niagara Falls, N. Y.,
ton lots, per lb. contained
titanium

Less ton lots

Ferrotitanium, 20%-25%, 0.10 C
max., ton lots, per lb. contained
titanium

Less ton lots

High-carbon ferrotitanium, 15%20%, 6%-8% carbon, contract
basis, f.ob. Niagara Falls, N. Y.,
freight allowed East of Mississippi River, North of Baltimore
and St. Louis, per carload

St. Louis, per carload

Ferrophosphorus, 18% electric or
blast furnaces, f.o.b. Anniston,
Ala., carlots, with \$3 unitage
freight equaled with Rockdale,
Tenn., per gross ton

Ferromolybdenum, 55-75%, f.o.b.
Langeloth, Washington, Pa.,
yquantity, per lb. contained Mo.
Calcium molybdate, 40%-45%,
f.o.b. Langeloth and Washington,
Pa., any quantity, per lb. contained Mo

Molybdenum oxide briquetes, 48%52% Mo, f.o.b. Yangeloth, Pa.,
per lb. contained Mo

Molybdenum oxide briquetes, 48%52% Mo, f.o.b. Yangeloth, Pa.,
per lb. contained Mo

Circonium, 35-40%, contract basis,
f.o.b. producer's plant with
freight allowances, per lb. of
alloy. Add 4c for spot sales

Carload lots

Zirconlum, 12-15%, contract basis,
f.o.b. Niagara Falls, carload,
bulk

Ton lots

No. 75-50.

Ton lots

Nigara Falls

Soc.

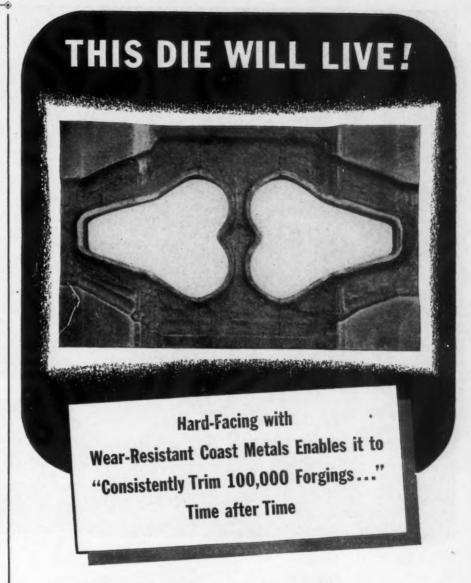
Nigara Falls

Soc.

Simanal (approx. 20% Si, 20%
Mn, 20% Al), contract basis,
f.o.b. Philo, Ohlo, with freight

Soc.

Simanal (approx. 20% Si, 20%
Mn, 20% Al), contract basis,
f.o.b. Philo, Ohlo, with freight 60c. 45c. Ton lots Ton lots
Simanal (approx. 20% Si, 20%
Mn, 20% Al), contract basis,
f.o.b. Philo, Ohio, with freight
not to exceed St. Louis rate allowed, per lb.
Car lots
Ton lots



There, in a word, you have the story of this trimming die for forming tank tread end connectors.

Made of ordinary carbon steel, 3' thick, it is constructed with a 3/16" x 3/16" ledge, cut into the top edge of the trimmer. This cut-out is protected with a wear-resistant Coast Metals Hard-Facing, and then the overlay is ground to the correct size and shape. When the die needs reworking, another Coast Metals

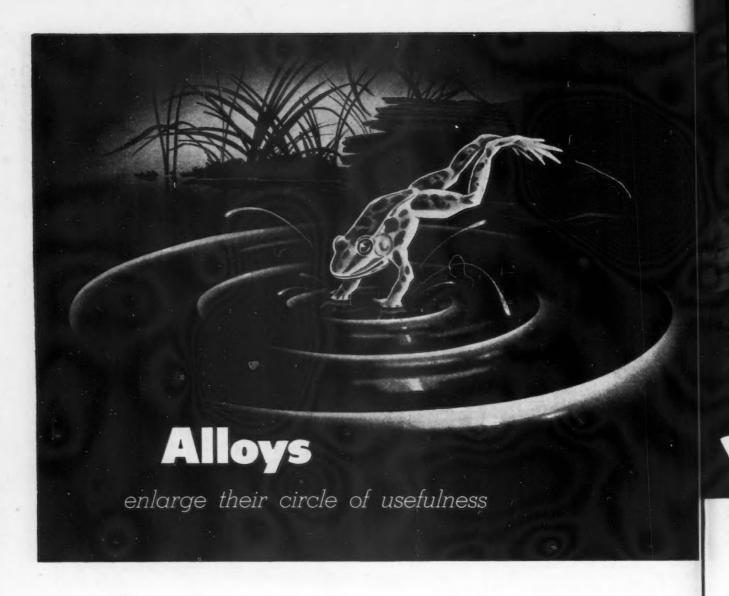
overlay, requiring only 4 or 5 ounces of weld rod, makes it good as new, ready for another life of genuine service.

Coast Metals can be welded either by the electric arc or the acetylene torch to all ferrous metals, including manganese steel, alloy steel, cast iron and chilled iron. New booklet, "Your Best Protection Against Wear" contains full details. Write for your copy today.

COAST METALS, INC.

Plant and General Offices: 1232 Camden Ave., S. W. Canton 6, Ohio Executive Offices: 2 West 45th Street, New York 19, N.Y.





Increase of available supplies, as in the case of Tungsten, improved economy of use, as in the case of Molybdenum, and newly discovered metallurgical potencies, as in the case of Boron, point clearly to larger, more varied employment of alloy steels and irons in the months just ahead.

Alloying for one purpose or another will undoubtedly be hastened by the competitior of non-ferrous metals and other materials.

One noteworthy development is the growing use of Molybdenum in structural steels, justified by the high degree of improvement obtained from very minute additions of the alloying element. The Molybdenum Corporation has been unsparing in its effort to keep abreast of such advances, both as a source of metallurgical advice and as a supplier of alloying materials.

Inquiries on any use of Molybdenum, Tungsten, or Boron are given careful attention.



AMERICAN Production, American Distribution, American Control—Completely Integrated. Offices: Pittsburgh, New York, Chicago, Detroit, Los Angeles, San Francisco, Seattle. Sales Representatives: Edgar L. Fink, Detroit; H. C. Donaldson & Co., Los Angeles, San Francisco, Seattle.

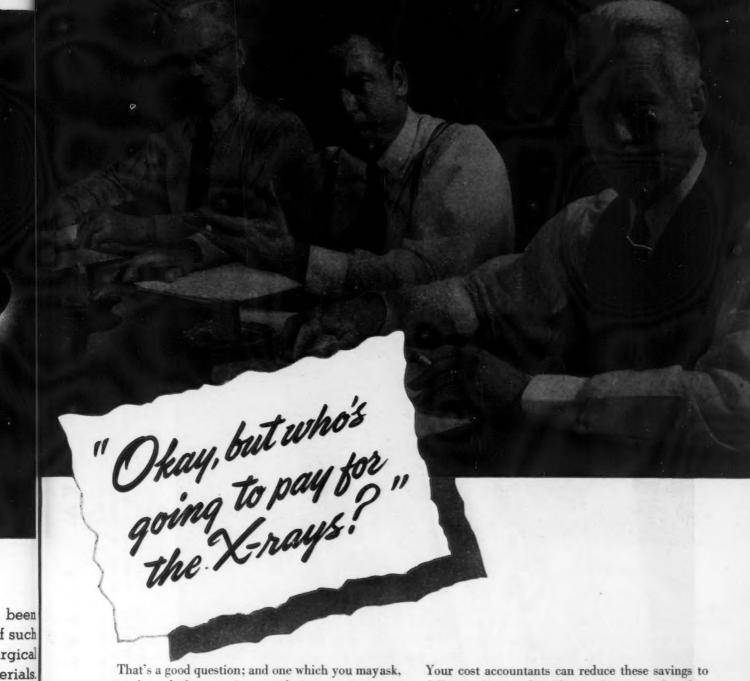
MOLYBDENUM

CORPORATION OF AMERICA

GRANT BUILDING

PITTSBURGH, PA.





That's a good question; and one which you mayask, or be asked, soon in considering your postwar operations. The answer is simply this—in industry, generally, radiography more than pays for itself.

enum

ntion

In your particular business, the cost-balancing savings may be, for example, in machining where radiography eliminates man and machine time spent on defective parts—

... or it may be in your foundry in the determination of most efficient casting technics;

...or in assembly, or molding, or welding, or inspection;

... or it may be in the design of your product itself which might be lighter or simpler, or capable of being produced by more economical methods. Your cost accountants can reduce these savings to dollars and cents. In addition, there are other, less tangible, benefits—

... the sales advantages of lighter, sounder, surer products;

... the maintenance savings resulting from better performance;

... and the greater general good will of your products, and your company.

To help radiography pay its own way, Kodak supplies a line of special films, solutions, and accessories . . . and offers the experience accumulated in 17 years of research in this field. Eastman Kodak Company, X-ray Division, Rochester 4, N. Y.

Kodak

The Film tells the story

War plants are obtaining more production per man-hour with Niagara

Power Squaring Shears because of accurate cutting, quick setting, ball ass
bearing, self-measuring parallel back gages, full visibility of cutting kn

line, instant acting Niagara sleeve clutch and other modern features. Bu

Enclosed drive with gears, clutch and eccentrics running in oil assure long life and low maintenance cost. Four-edge, solid tool steel knives are standard equipment. Niagara Machine & Tool Works, Buffalo, N. Y. District Offices: Detroit, Cleveland, New York.

Shear knives available for cutting alloy and special steels. Let us know what you desire to cut. Frompt delivery on spare knives for Niagara Squaring Shears. Also factory reginaling service by the same skilled men who grind new Niagara knives.

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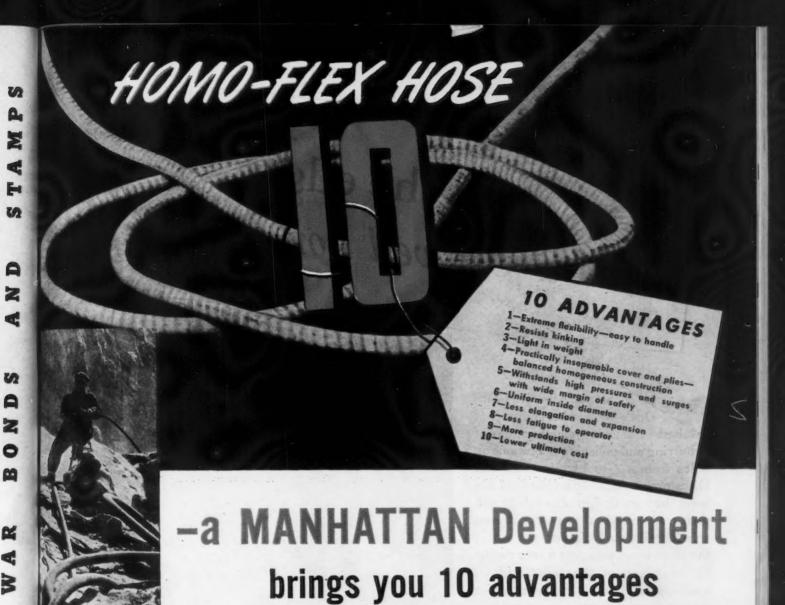
WAR BONDS AN

STATE

UNITED

BUY

138-THE IRON AGE, June 29, 1944



IN WAR—The homogeneous and extremely flexible construction achieved by MANHATTAN Strength Members of super-strength cords and the balanced, engineered method by which they are applied and inseparably combined with the FLEXLASTICS* tube and cover, together give a service impossible a few short years ago.

Every one of these advantages contributes to greater production through less fatigue to operator and to much longer hose life—therefore fewer interruptions.

Still another MANHATTAN advantage—Turnate Vulcanization—imparts added strength to Homo-Flex Hose. This process applies pressure progressively before and during vulcanization to give not only uniform inside and outside diameters, but

also uniform texture and resilient strength. The distinctive spiral marking identifies Turnate Vulcanization.

IN PEACE—All these advantages will have cumulative value for you in the forthcoming competitive period. Then the multiple economies of long service life; resistance to high working pressures and surges; easy handling with less operator fatigue because of its light weight; toughness to withstand wear, abrasion and kinking; will help keep costs down and profits up.

Manhattan's Condor Brand Homo-Flex Hose is or will be available in types for the following services: Air, Water, Steam Pressing Iron, Orchard Spray, High Pressure Mine Spray, High Pressure Oil Spray.

Buy more BONDS to bring the boys down the home stretch

 The term FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

eep Ahead With



THE MANHATTAN RUBBER MFG. DIVISION

of Raybestos-Manhattan, Inc.

Executive Offices Passaic, New Jersey

important in war or peace

Right at the edge of a job well done!

Use of Slotted Abrasive Cloth Discs by Carborundum has resulted in amazing simplification of deburring and polishing operations on holes from 3/8" to 51/2" in diameter. Discs proportionately larger than the holes they are designed to deburr and polish are attached to power driven spindles. Pressed against the work, the discs cone, and give a true radius to the edges of the holes without touching the sides. It's a fine example of choosing the right abrasive product for the job.

The use of abrasives in deburring, polishing, and in tool room work has seen an enormous advance in the last year or so. That's why we urge you to call on Carborundum Abrasive Engineering Service for help with your abrasive problems. Just call our nearest sales office. The Carborundum Company, Niagara Falls, N. Y.

CARBORUNDUM ABRASIVE PRODUCTS

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids



Coated Abrasives by CARBORUNDUM

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)

SEVERANCE CHATTERLESS COUNTERSINKS GIVE MIRROR FINISH...

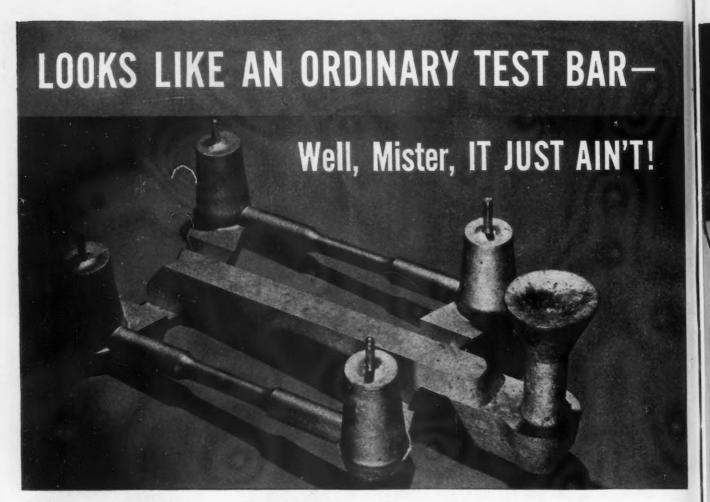
If your production calls for perfectly finished seats, you simply can't beat Severance Chatterless Countersinks. In a few seconds, they produce a finish that will stand up to a commercial ground job. Using a standard type, a finish sufficiently smooth for valve seatings may be obtained. Because of their staggered tooth design, they take clean, shearing cuts—thereby eliminating chatter. Available with any angle and in a wide variety of diameters, lengths and shanks. Heavy duty types have tang shanks and may be used with a Glenzer sleeve. Write today for complete facts about how Severance Chatterless Countersinks can solve your countersinking problem.



Severance Midget Milling Cutters and special cutting tools of many types are available, with Severance tooth design, for finishing every kind of wood, plastic, metal and alloy. These fast-working tools take sharp bites, throw off clean chips. For best service, order new cutters and send your worn cutters for regrinding to the nearest Severance plant.

Severance

MIDGET MILLING CUTTERS • PRECISION REGRINDING • SEVERANCE TOOL INDUSTRIES INC., SAGINAW, MICHIGAN • PLANTS IN LONG ISLAND CITY 1, NEW YORK; DETROIT 2, MICHIGAN; FORT WAYNE, INDIANA; CHICAGO 6, ILLINOIS; AND LOS ANGELES 21, CALIFORNIA. IN CANADA: 60 FRONT STREET WEST, TORONTO, ONTARIO.



HERE'S WHY:

- It's a general-purpose Aluminum-Copper-Silicon-Magnesium Alloy
- Has good corrosion resistance
- High strength
- Good fluidity at low temperatures
- Makes Pressure-tight castings
- Stress relieves at 450° F.
- It's made by Federated

FREE—A new booklet, "Some considerations in Making TEST BARS" is available. Write today for booklet TB-9.

FEDERATED ALUMINUM ALLOY 150.4*

	Typical Sandcast Properties		Tensile Streng P.S.I.	th Yield St. P.S.I. (0.29		Elongation in 211
	As cast		27,500	17,50	00	2
	As cast and stress relieved (5 hours at 450°F.)		28,000	22,00	22,000	
	Solution Heat Treated 12 hrs. at 980° F., quenched in boiling water & aged 3 hrs. at 310° F.			25,00	25,000	
Solution Heat Treated 12 hrs. at 980° F., quenched in boiling water & aged 3 hrs. at 400° F.			100	37,0	00	11/2
	ANALYSIS					
	-				drawn a	
	Copper	1.25-1.75	Zinc	0.2-0.4	Titanium	0.2 Max.
	Silicon	5.0-6.0	Manganese	0.3-0.9	Others	0.2 Max.
	Magnesium 0.35-0.55		Nickel	0.2 Max.	.2 Max. Aluminu	
	Iron	0.5 - 0.9	Chromium	0.2 Max.		

*Our aluminum alloy numbers indicate nominal composition to the nearest per cent by the following sequence of elements: Cu (1) — Si (5) — Mg. (0.4) etc.



Federated

METALS DIVISION

AMERICAN SMELTING and REFINING COMPANY

Nation-wide service with offices in principal cities

INCREASE YOUR MAN-POWER BY BETTER SELECTION OF . . .

MACHINE - POWER

Radial Drill

American industry has about reached the "bottom of the barrel" for man-power. Any required increase in production, therefore, must come from improved efficiency of pres-

ent workers and their machines.

Alert manufacturing executives have substantially increased production with marked savings in power, capital investment and operating cost—by using fast, streamlined Walker-Turner Machine Tools on hundreds of jobs where heavier and slower equipment had been employed formerly. A few of these "speeder-uppers" are shown on this page. Send for Catalog.

WALKER - TURNER COMPANY, INC.



15" and 20" Drill Presses 260 to 5200 R.P.M. Hand or



MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED . RADIAL DRILLS
METAL-CUTTING BAND SAWS . POLISHING LATHES . FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL . MOTORS . BELT & DISC SURFACERS



PROUDLY We Fly This Flag

Our Armed Forces have done a mighty job. Holding off our enemies on two fronts they have armed and equipped for the bigger job ahead—turned from the defensive to the offensive and at this moment are delivering the tremendous blows that will bring peace.

We are humbly proud of and grateful to our Army and Navy—for the job they have done—for the skills they have demonstrated —for the vigor and speed with which they have put those skills to effective use.

We are glad to be able to turn our peacetime skills to the undivided purpose of backing them. Our hearts swell with pride—when our Army and Navy tells us, "Well done"—and further recognize the work of the men and women of Parker

by granting us the right to wear the "E" pin and fly above our factories the "E" flag—symbol of distinguished service in backing our Armed Forces.



PARKER RUST PROOF COMPANY . MORENCI AND DETROIT 11, MICH.

BONDERIZING

PARKERIZING .

PARCO LUBRIZING

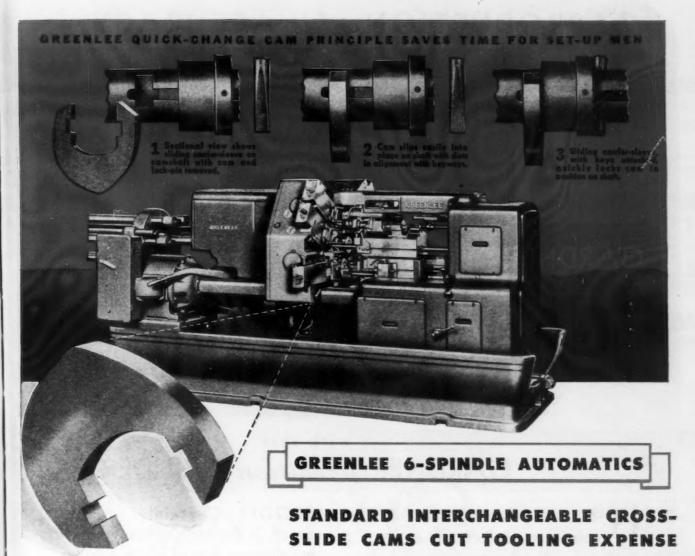
HOLDS PAINT TO STEEL

INHIBITS RUST

RETARDS WEAR

PARKER PRODUCTS CONQUER RUST

144-THE IRON AGE, June 29, 1944



SMALL CAM INVESTMENT HANDLES 90% OF AVERAGE JOB-SHOP REQUIREMENTS

With a Greenlee 6, a job-shop can handle 90% of average requirements with but fifteen standard cross-slide cams which provide a wide variety of feeds and strokes. Seldom are special cams required. An exclusive Greenlee feature eliminates the use of cams on main tool slide.

The following list of cams are all that are usually needed for one machine to serve a wide range of requirements.

Quai	nti	ty							Cam Ratios
2									. 2:1
3									. 3:1
3									. 4:1
2			4						. 5:1
3						۰			. 6:1
1	0								. 8:1
1									Cut-Off
TOI					-			-	

INVESTMENT ... ONLY \$131.35 * Standard cams are made in ratios to tool-slide feed and stroke. For example, 2:1 Cam = $\frac{1}{2}$ feed of tool-slide and $\frac{1}{2}$ stroke. Feed = feed per revolution. Simplicity of design makes it possible, today, to operate Greenlee Automatics effectively on more than just the ordinary "cut-and-dried" multiple-spindle screw machine jobs. The crasslide cam feature on the Greenlee, for example, promotes production efficiency on many short-run jobs by

As shown in top photos, individual cams (only one used for each independently operated cross-slide) are quick and easy to slip on or off. All cams are completely interchangeable and may be used on any cross-slide. Thus, only a very few are required - see details at left.

reducing set-up time and through savings in tooling expense.

There are other time-saving, cost-saving Greenlee features, too, that offer production advantages in building weapons of war or products of peace. Ask for latest details. Perhaps Greenlee engineers can help you tie in war demands, today, with your peace conversion plans. Write —

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MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

Get PRODUCTION plus ACCURACY



GARDNER Precision GRINDER

HIGH production—close accuracies—you definitely can get BOTH, on such of your parallel-surface parts as are adapted to Gardner DOUBLE Grinding!

Several models of Gardner PRE-CISION Grinders, in sizes ranging from 15" up to 30" wheels, are available for dozens of jobs which were formerly ground one side at a time, on the conventional Surface Grinder. PROOF? Certainly! Ample proof, in the form of many actual installations, one of which is shown here.

This No. 125-23" machine grinds bearing races, $1\frac{7}{8}$ " x $1\frac{7}{8}$ ", AT THE RATE OF 30 TO 40 PIECES PER MINUTE, using a rotary work carrier. Stock removal averages .008" to .010" overall, and tolerances of .0003" to .0005" for squareness and parallelism, and .003" for uniformity, are maintained.

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Investigate the possibilities of this method-Ask for data on GARDNER Double GRINDING!

GARDNER MACHINE COMPANY
412 East Gardner Street * * * * Beloit, Wisconsin, U.S.A.

1 FORGINGS CONSERVE METAL



Strength is a primary quality advantage of forgings. The metal bulk of many parts may be reduced because maximum tensile and torsional strength is obtainable in forgings through controlled grain flow and distribution of metal.

FORGINGS LESSEN SCRAP



In forgings it is possible to obtain uniformity of physical properties in the exact degree desired. Practically no rejections result, Heat treating forgings is a straight-forward production procedure, controllable at all times.

IN FORGINGS You get MAXIMUM METAL QUALITY

Forging, or hot working metal, with closed impression dies improves metal quality by directional working of the fiber structure to provide high strength and toughness to resist stress or shock where most needed in service.

Maximum strength for a given amount of weight is just one of 7 advantages that forgings offer. Forgings offer many benefits beyond what the specifications call for. Are you obtaining the utmost benefits from your use of forgings? Recheck every forged part you use against the 7 advantages forgings offer. It will repay you many times over

3 FORGINGS CONSERVE METAL BY WEIGHT



Reduction of dead weight is a common result of using forged parts because forging produces maximum strength in lighter sectional thicknesses, thereby permitting the use of lighter weight parts.

4 FORGINGS FACILITATE RAPID ASSEMBLY THROUGH WELDING ADAPTABILITY



Forgings provide a welding adaptability of widest range for fabricating complicated parts from two or more forgings.

FORGINGS REQUIRE LESS TIME TO MACHINE AND FINISH



Forgings are shaped in closed dies and require a minimum of machining or finishing because there is no bulk of excess metal to remove, and freedom from concealed defects avoids loss from rejections.

6 FORGINGS REDUCE ACCIDENTS TO MEN



Freedom from concealed defects is an outstanding characteristic of forgings that underlies the greater margin of safety that forgings afford for men, machines and material.

FORGINGS CAN TAKE IT



By the forging process, stamina is achieved through concentration of grain structure and fibre formation at points of greatest shock and strain. Forgings provide high fatigue resistance which underlies dependable performance, and continuous operation over longer periods of use.

...plus these advantages

for the slight effort it entails. It should reveal unusual benefits which may have been unintentionally neglected or overlooked. Those manufacturers who have had long experience in the use of forgings have found, by recheck-

> ing parts against these advantages, further opportunities to reduce weight, improve performance, and save machining time. Consult a forging engineer, connected with your source of supply, whose broad experience will be help-

whose broad experience will be helpful to you in rechecking your use of forgings against these advantages,

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O Cotton Cord

◆ Steel Cable

B Rayon Cord Y-Belts



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Whenever a drive in your plant is wearing out belts faster than it should-or is giving any other trouble-just pick up your phone and call the Gates Field Engineer.

He can quickly analyze your problem and, in most cases, he can correct the trouble very easily without needing to specify the use of any special-structure belts.

In some installations, however, belts having special characteristics will prove to be the most efficient and economical that you can use. For example, a V-belt with tension members composed of rayon cords will, in some installations, have advantages over the standard cotton cord construction.

Again, Static-Safety V-belts may best fit your special needsor V-belts with tension members composed of flexible steel cables may be the most efficient and economical despite their higher initial

Outstandingly, the Gates synthetic rubber V-belt—which has been in extensive use for more than 6 years now—is piling up amazing service records. Under severe conditions of oil and heat, the Gates special synthetic belt actually wears 2 times to 3 times as long as any natural rubber belt!

To find out which particular type of V-belt will serve YOU best involves no more effort than merely picking up your telephone directory and calling the number there listed for your Gates Field Engineer. He will know the type of V-belt it will pay you best to use-and he will always recommend the practice that will be most efficient and economical for you.

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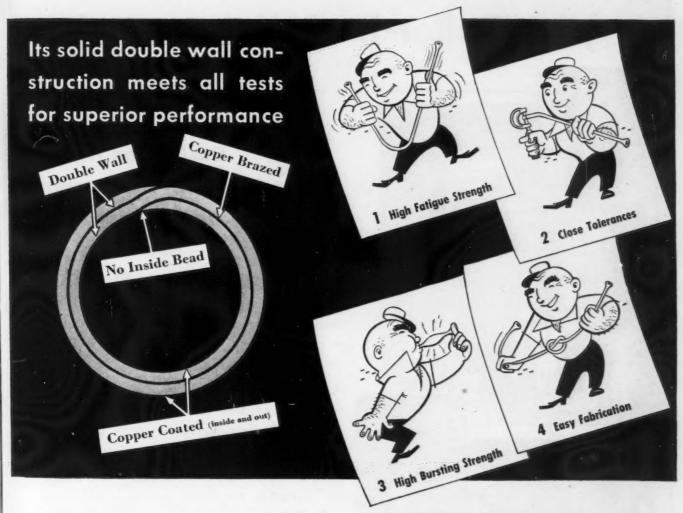
148-THE IRON AGE, June 29, 1944

Bune rolle strip steel. throu whie. wall braze

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Pacific San Fre

Bundyweld Steel Tubing



Investigate Bundyweld for your tubing requirements

Bundyweld Steel Tubing is laterally rolled twice around from a single strip of copper-coated S.A.E. 1010 steel. The rolled tube is then passed through a brazing furnace from which it emerges as a solid, doublewall steel tube completely copperbrazed throughout the entire 360° of wall contact.

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The Bundy double flare, illustrated at the right, assures leakproof, pressure-proof joints, and safely permits frequent removal and replacement of fittings as well as over-torqueing.

Bundyweld is furnished hard or annealed in a wide range of standard diameters and gauges up to 5/8" O.D. Special sizes, cold drawn as desired. Also furnished in Monel.

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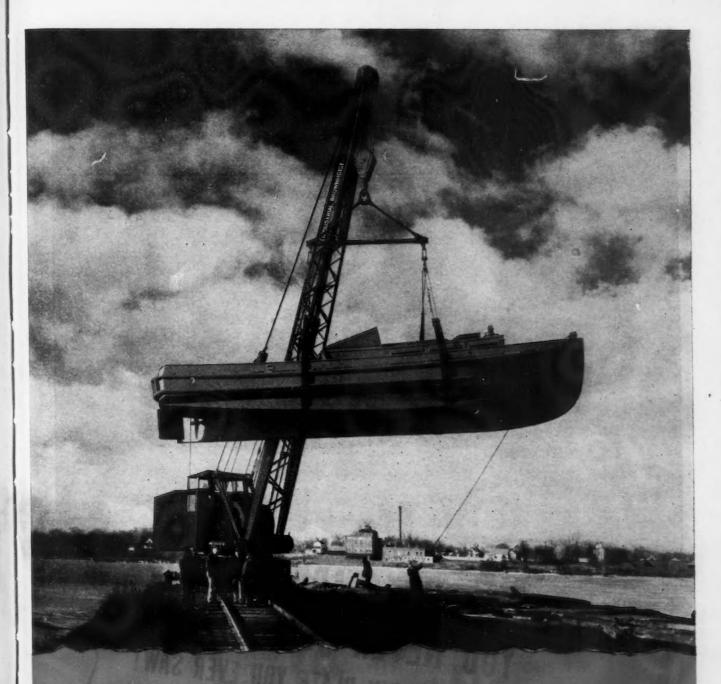
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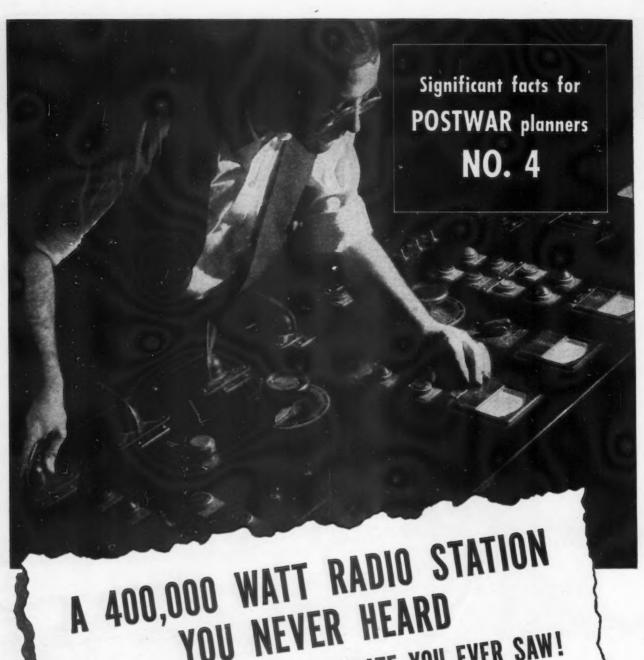
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(new and substantially completed)

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- LOT NO. 2—MOTOR DRIVEN BILLET SHEAR, GAUGE AND BACK SHEAR TABLE.
- LOT NO. 3—6-STAND 24.8" TWO-HIGH CONTINUOUS BILLET MILL. CAPACITY APPROXIMATELY 700,000 NET TONS PER YEAR.
- LOT NO. 4—BILLET TURNOVER, VERTICAL EDGING MILL, FIVE. (5)
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BUSINESS FUTURES

are being charted with these

FOUR GUIDES



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The methods used by some of the largest war-goods producers to achieve maximum output with a controlled flow of materials are detailed in "Stock Control for the Manufacturer". Twenty sets of actual forms are included, with helpful analysis of each.

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"Cost Analysis for Profit Control" shows the latest techniques in efficient cost accounting systems and procedures. Included are twenty working samples of Kardex *Visible* Records and details of fifty types of cost systems now used by well-known organizations.

GUIDE TO REDUCED MATERIALS INVENTORIES

From the Office of the Chief of Ordnance, U. S. Army, has come a simplified method of production and material control, recommended as sound business practice for manufacturers. This is presented in full detail in "Control for Minimizing Commitments, Work in Process and Inventories".

GUIDE TO SUCCESSFUL CONTRACT TERMINATIONS

"Effective Control of Terminated Government Contracts as Practiced by Sperry Gyroscope Co., Inc.", describes preparations and procedures that have resulted in outstandingly successful negotiated settlements. Twenty-six pages full of good suggestions!

During war the tremendous influence of adequate administrative control is reflected in higher production, in conservation of materials, in improved cost record practices leading to efficient handling of government contract terminations. Because such control is urgent today—and will be

more so in the future—Remington Rand has assembled in four special books a wealth of information on the *graphic* methods of record control now used by many business organizations. Based entirely on actual experience, these publications demonstrate how the "Fact-Power" of

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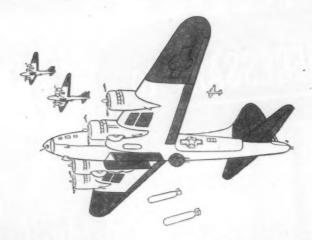
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BRIGGS REPORTS on One Billion Dollars in War Orders

—and how the money is being spent

During peacetime, Briggs Manufacturing Company is the Nation's largest independent automobile body manufacturer. In the war Briggs is devoting its peacetime skill to making bodies and parts for medium tanks and aircraft; also, bomber turrets, droppable gas tanks and non-ferrous castings.

Briggs war orders total approximately \$1,000,000,000. This money has been spent or is being spent as indicated in the box shown herewith. Percentages are based on distribution of Briggs 1943 sales dollar.

In 1943 Briggs did twice as large a dollar volume of business as it did in an average peacetime year. In 1943 Briggs delivered double the number of tank hulls delivered in 1942. In the same year Briggs delivered to the U. S. Army and Navy

more than 22,500,000 pounds of airplane sections, as compared with 7,000,000 the year before. This included almost twice as many bomber fire-power turrets as in the previous year. Total shipments to date of airplane sections by Briggs exceed 45,000,000 pounds.

Earnings by Briggs hourly paid employees in 1943 averaged \$3,159.00. On December 31, 1943 there were 39,312 people on the Briggs payroll, of which 21,737 were men and 17,575 women. This is 48% greater than on December 31, 1942 when Briggs payroll was 26,401 people. In the first five months of 1944, shipments of airframe

53.6% to about 40,000 employees for wages and salaries.

0.2% for executive salaries.

32.1% to some 2,000 subcontractors for materials, supplies and assemblies.

1.9% to stockholders for dividends.

9.2% for taxes.

1.2% for depreciation.

1.2% for reconversion expenses and other costs arising from the war.

0.6% left in the business.

sections, by Briggs, were at considerably greater monthly rates than during any other months since the war began. Production of tank hulls was almost equal to the 1943 rate. Deliveries of auxiliary gas tanks, for the first five months of this year, were 7 times the total for 1943, and shipments of aircraft fire-power turrets were at a rate almost twice that of last year.

Unless very extraordinary developments take place, Briggs 1944 war business should be equal to, or exceed, its record 1943 year.

During the war, Briggs has shown that experience in manufacturing good automobile bodies, plumbing ware and non-ferrous castings has enabled it to turn out good "bodies for bombers, fighters, tanks" and other war requirements. Briggs is

glad that it has been able to play an important part in the Nation's war effort. All of its facilities and energies will continue to be available to the Armed Forces until Victory has been won.

However, when Victory does come, Briggs is prepared to go about the job of reconversion with the same dispatch and intensity that it applied to the preparation for war, and, if it is allowed to do so, can go back into at least some peacetime production quickly.

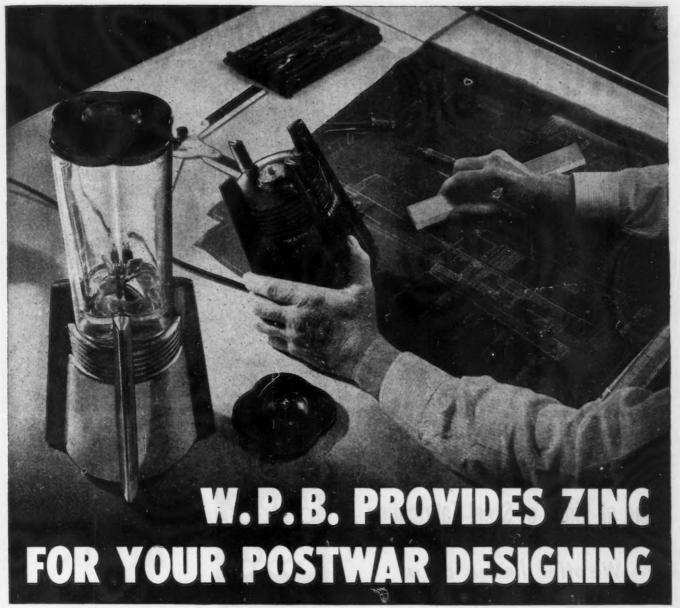
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The June 2, 1944 Amendment to W.P.B. Conserva-tion Order M-11-b states that "Zinc may be used to make experimental models or test runs, but only the minimum number of models or minimum size run needed to determine the suitability of the item for com-mercial production." Such models may not be used for advance sales promotion, nor can war production manpower or facilities be diverted for experimental

activities, but, with these understandable restrictions, you can now get those postwar zinc alloy die castings all set to go!

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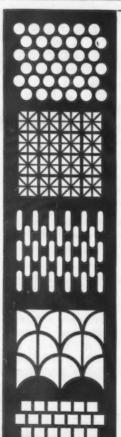
dustries to find new products and processes for postwar. If your idea is acceptable to them an attractive contract for purchase or licensing will be arranged. (Our service is free to you.) Send a copy of patent,

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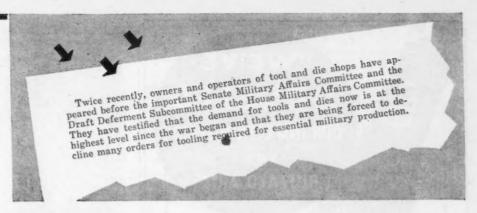
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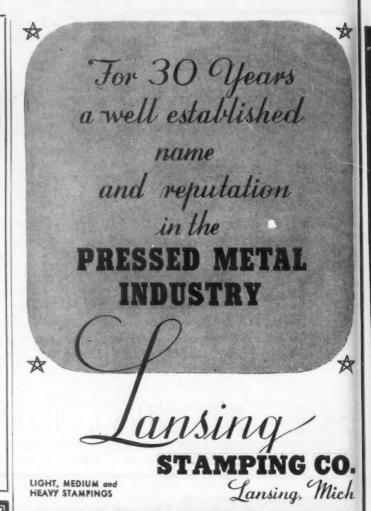
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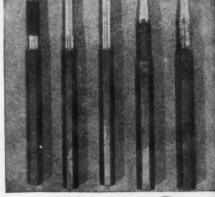
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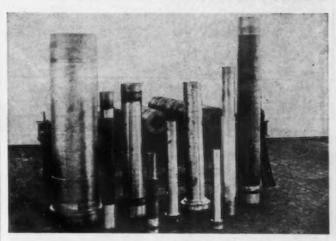
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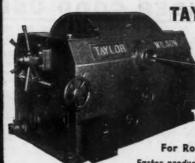


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8" to 10" Ajax I

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Characteristics. Generation 2300 volt, 3 phase, 69
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PRESS—HYDRAULIC
7500 ton R.D. Wood Four Column Press, 4'11" x
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Arr. M.D. Capacity 6" Square
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4-spindle HENRY & WRIGHT BALL BEARING DRILL (11)

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24"x36"x10' INGERSOLL HORI-ZONTAL SPINDLE SLAB MILL-ING MACHINE, arranged for motor drive

26"x25"x12' INGERSOLL ADJUST-ABLE RAIL MILLER, arranged for motor drive, one head

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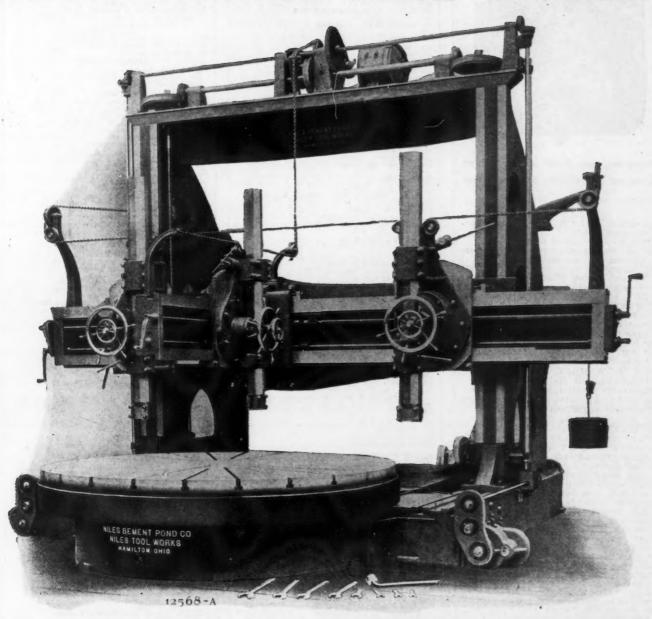
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Will handle work up to 24' diameter x 96" high.

Equipped with 2 swivel heads on crossrail and 1 swivel head on extension arm.

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42" N.B.P. Car Wheel Borer
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Drill, M.D.
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98"x36"x42' S O U T H W A R K Heavy
Planer, Four Heads, 230 Volt, D.C.
48"x48"x24' N.B.P. Heavy Planer, Two
Rail, One Side Head, M.D.

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#1 L&A Multiple Punch, 100 Tons, 72"
between housings
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20", 60 lb. and smaller "Throat, 8"x1 1/16" LONG & AL-STATTER Shear

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42" Throat, 134"×1" HILLES & JONES Punch, M.D. 4" LANDIS Pipe Threading Machine

6" BIGNALL-KEELER Improved Pipe Machine

10" STANDARD Pipe Threading Ma-

BAKER Heavy Duty Automatic Tap-4"



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2½" Universal, Binsee 4" Dietrich & Harvey Floor, M.D. 1" Binsee 4½" Bement-Niles

TURRET LATHES

TURRET LATHES

No. 3A W. & S., 4½" hole
26" Libby, 7½" hole
18" Libby, 3½" hole
18" Libby, 3½" hole
24" Gisholt, 6½" hole
Faster No. 1B, M.D.
Foster Nos. 4, 5, 6
W. & S. Nos. 2, 4 Universal M.D.
W. & S. No. 3A
Gisholt Automatie. M.D.
1, & L. 2½"«24", 3½"«35"
Acme 3½x36" grd. head

GRINDERS

ORTHOGRAS
No. 10 B. & S., M.D.
P. & W., 14", 18", B.B. Vert. M.D.
Blanchard 26", 30", M.D.
Modern 12x48", M.D.
Norton Hydraulic 12x18", M.D.
Heald Nos. 55, 72A Internal, M.D.
Norton 50"x28", M.D.
Gardner 72", Disc, M.D.

LATHES

LAIPES
14"x8' Sebastian Grd. Head
48"x12" Harrington Gap Sid. Bed
McCabe 26-42"x14'
26"x24" Putnam 3 step cone, D.B.G.
24"x12" Boye & E., 3 step cone, D.B.G.
20"x14" Ahn-Larmon, raised to 24"
16"x 8' Lodge & S. Grd. hd., taper, M.D.
14"x 6' Hondey, tie bar, taper
14"x 6' Mulliner, taper, collets

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New Britain 15%"x7" 6 spindle
Cleveland Model A, ½", 5%", 1½", 2"
Cleveland Model B, 1", 2"
Cleveland Model B, 1", 2"
Gridley 14½, 2½, 4 spindle
Cleveland 7%" Model M, 4 spindle
Gridley 4½", single spindle, M.D.
B, & S, Nos. OD, OG, 2G
P, & J, No. 6A, M.D.

SHAPERS

14" P. & W., M.D. 20" Stockbridge 26" Stockbridge, M.D. 20" G. & E., S.P.D.

GEAR CUTTERS

No. 3 Barber-Colman Gear Hobbers B. & S. Nos. 3-26", 4-36" Gleason 11" Bevel Pfauter No. 3 Gear Hobber, 59" cap.

MILLING MACHINES

MILLING MACHINES

No. 2A Milwaukee, S.P.D.

No. 1½ Cincinnati Universal

No. 1Y B. & S.

No. 3S Cincinnati, S.P.D. rapid traverse

No. 2 B. & S. Vort.

No. 3 Brown & Sharpe Plain

No. 0Y B. & S., M.D.

No. 1Y B. & S., M.D.

B. & S. No. 12

Hall Planetary Model D Thread Miller

Providence Planer Type 32"x8"

Nos. 2, 3, 4 B. & S., and Cincinnati Plain & Univ.

Becker Nos. 3, A B., 6 Vort.

Nos. 3, 4 Cincinnati Vert.

Nos. 3, 4 Cincinnati Vert.

No. 2 Kent-Owens

No. 3 LeBload Universal

No. 3 Cincinnati Vertical Miller

RADIALS

4' American Triple Purpose
8' American Triple Purpose, M.D.
5' Cincinnati-Bickford
2½' American, M.D.
4' Mueller, M.D.
4', 5' Western, S.P.D.

MISCELLANEOUS

MISCELLANEOUS
6 spindle Avey Drill, 15" overhang
800 ton coining press
Rochester No. 5C High Speed Hammer
Pels 6' throat punch
P. & W. 6" Vert. Shaper
Marvel Metal Band Saw, M.D.
McCabe ½" Flanger
Pipe Machines, 2", 4", 6", 8", M.D.
N.B.P. 15" Slotter, M.D.
N.B.P. 15" Slotter, M.D.
No. 30 Nates Multiple Spindle Drill
Potistown Tappers
150 ton United Steam Hammer
Hall Planetary Thread Miller
Thompson-Gibbs Spot Welders, 17 KVA
Anderson Tapper, No. 23A Quickwerk Rotary Shear
Borton No. 3D Vortical Miller, M.D.

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45 Crosby St. New York 12, N. Y. CAnal 6-0421-3

QUALITY TOOLS

AUTOMATICS

14"x19" Fay automatic laths
1" Cleveland Model J double end
1%". No. 55 National Acme with tapping attachment
1%". No. Britain 6 spindle
4½" Gridley Model H chucker
7" Baird 8 spindle chucker
No. 18 Gisholt Simplimatics
BROACHES

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2 ton American vertical hydraulie No. 3 Lapointe double screw type No. 4 Lapointe screw type COMPRESSORS

427' Chicago tandem steam 550' National, electric drive 1400' Sullivan, electric drive

DRILLS

18". Ediund, 1, 2 & 4 spindle sens.

15" Avey No. 2B sensitive

21" Cineinanti: Blekford Mfg.

Nos. 15½. 15½0 & 15½F Feete Burt

Nos. 11, 12 & 13 Nateo multiple

No. 430 Barnes double end

Kingsbury & Ediund unit heads

Kingsbury & Ediend unit heads

GEAR MACHINERY

No. 18HS Gould & Eberhardt hobbers

10°. No. 1 Less Bradner hebbers

10°. No. 1 Less Bradner hebbers

1ype 21 Fellows gear shaper

24°x12° Flather auto. spur.

26°x 8° Brewn & Sharpe auto. spur

36°x 8° Geuld & Eberhardt auto. spur

48°x10° Brewn & Sharpe auto. spur

15° Gleason spiral hevel pinion reughers

15° Gleason spiral hevel gear roughers

15° Gleason bevel testers & lappers

Lipe 2 spindle chamferer

Ingle test rounder

Model B National gear cutter checker

GRINDERS GRINDERS

12"x38" Landis
12"x48" No. 3 Cincinnati universal
18x36 & 16"x32" Landis
24" No. 84 Gardare apposed-dise grinder
Nos. 50 & 68 Heald sylinder or internal
No. 41 Oliver 134" drill grinder
No. 72 Heald electric indicator automatic internal
18"x50" Safety Emery surface
LATLES

8" Sundstrand Stub
1"x18" Pratt & Whitney autematic
3½" & 4"x38" Lo Swing
9"x14" Porter Cable
13"x6" Autematic threading
Melling erankshaft lathe
18"x 8" Greaves Klusman
36"x16" Putnam geared head
LATHES, TURRET
No. 2 Pratt & Whitney
21" Gisholt, 3½" hole
22" Libby, 4½" hole
22" Libby, 4½" hole
26" Libby, 4½" hole
26" Libby, 4½" hole
26" Libby, 4½" hole
26" Libby, 4½" hole
38", No. 38 Foster, 5½" hole
MILLERS

28", No. 3B Foster, 5\%" hole MILLERS
No. 3 Van Norman duplex, vert. attmt. Type C Hall planetary
Types 10 & 45 Preductematic
No. 1 Davis & Thempson duplex
No. 3 Turnmillers
48" Oesteriein tilted offset
3\%" bar Beeman & Smith Bering Mill
3" Universal horiz, boring mill
40" Bullard vert. bering mill

PLANERS

24"x24"x5' Gray 24"x24"x8' Weedward & Powell 36"x36"x16' Cleveland openside RIVETERS
Nos. 2A hy. dy., 5½ B & 7B High Speed

SHAPERS 16" Milwaukee, Swivel table 26" Lynd Farquhar shaper planer 36" Merten draw eut

SHEARS
No. 180 Tessmer sprue eutter
1½" Lewis alligator
8"x8"xi" Long & Alstatter double angle SWAGER No. 6HS Langeller

TAPPERS
No. 1 Garvin
1" National 6 spindle nut
Nateo 1 & 2 way lead serew
THEADERS
%4" Economy type R auto. stud threader
1" Cleveland Model J. deuble end for threading.
drilling, pointing and turning
2" Rogaco pipe threader
11PCETTEDS. & FORGING ROLLS

UPSETTERS & FORGING ROLLS

4" Ajax steel frame upsetter
No. IA Ajax taper forging rolls
MISCELLANEOUS MISCELLANE
Balancer, Micropeise flywheel
Balancer, Micropeise flywheel
Balancer, 44" Norton
Hener, No. 21! Barnes
Hoist, 1 ton LoHed, AC
Lapper, Ne. 10U Norton
Pross, No. PG5 Ferracute
Pross, No. B Telede OBI
Pump, 1000 GPM Fairbanks No. 1, No. R60 Yeder fender
Sprue Cutter, Tessware model i
Seraper, Anderson electric

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PLAIN: No. 2-B KEARNEY & TRECKER DOUBLE OVERARM. No. 5 CINCINNATI, Rect. Overarm. No. 4 CINCINNATI, Cone Drive. No. 4 LeBLOND HEAVY DUTY. No. 3 CINCINNATI S.P.D.

UNIVERSAL: No. 11/2 HENDEY NORTON. VERTICAL: Nos. 2 & 3 B&S.
No. 2 % B KEARNEY TRECKER

THREAD MILLS: 6"x48", 6"x72" P&W.
No. 3 LEES-BRADNER.

No. 3 LEES-BRADNER.

PLANER TYPE & SLAB:

42"x42"x13' INGERSOLL SLAB.

42"x36"x 6' B&S PLANER TYPE.

PRODUCTION: 10"x24"x15' KEARNEY &

TRECKER SIMPLEX, M.D.

OHIO Type P., M.D., Table 16"x72". New 1941.

18" CINCINNATI AUTO., M.D.

VERTICAL BORING MILLS

12 FT. BETTS, 2 swivel hds., 4 chuck jaws, M.D. 8 FT. KING, 2 rail heads, M.D. 10 FT. POND, 8" dia. table, M.D. 72" COLBURNS, M.D. (3). 53" N.B.P.: 51" BULLARD. 6" BULLARD MULT-AU-MATIC, M.D. 4 stations, Late Type Machine.

HORIZONTAL BORING MILLS

6" G. & L., No. 560T, Table type. New 1942. 8" N.B.P., Floor type, M.D. with motor. No. 43 LUCAS, 5" bar, M.D. 5" DETRICK HARVEY, M.D. 3½" & 3½" G. & L.; No. 3 LUCAS. 4" KEMPSMITH; 3½ BEAMAN SMITH. 5" OHIO SPINDLE, Table type, M.D.

GRINDERS

CYLINDRICAL: 10"x72" LANDIS plain, M.D. 14"x72" NORTON, 2"x16" wheel pump. No. 22 LANDIS, 12" swing, 34" bet. centers, 10"x36" LANDIS, 2"x14½" wheel.

INTERNAL: No. 72 HEALD SIZEMATIC. No. 52 GREENFIELD HYDROILS (2). No. 70 HEALD; No. 60 HEALD.

CENTERLESS: Model M-1 ZEPHYR.

UNIVERSAL: No. 1 LANDIS CYLINDRICAL. No. 2 CINCINNATI; BATH UNIVERSAL.

SURFACE: No. 16A BLANCHARD, M.D. No. 16 BLANCHARD, M.D.; No. 2 W&M. 15"x15"x96" NORTON; 2 Magnetic chucks. TOOL & CUTTER: No. 1 W&M.

32"x10'6" FARREL ROLL GRINDER. Grinds rolls up to 34" diameter. 10' between centers, M.D. AC motors.

PLANERS

36' SELLERS PLATE PLANER. Pneumatic holddowns. Motor drive. 60"x60"x12' CLEVELAND OPENSIDE, 2 heads 60"x60"x12" CLEVELAND OPENSIDE, 2 heads on rails, M.D. 60"x80"x18" WOODWARD POWELL, 4 heads. 60"x60"x18" POND, 2 heads, M.D. 60"x48"x12" GRAY, 4 heads, M.D. 44"x30"x12" GRAY, 2 heads on rail.

FLOOR DRILLS

No. 263 BARNES, 26" S.H. Camel Back Self-oiling, M.D. No. 242 BARNES, 25", M.D. 25" SNYDER, 36" PRENTICE, 24" BARNES 25" WEIGEL, 24" CINCINNATI, TAPER ATT. 2 SPINDLE FOOTE BURT Heavy Duty. 8 SPINDLE MULTIPLE, M.D., No. 5 M.T.

SLOTTERS & SHAPER

24" BETTS, Rapid Traverse, M.D. thru gear box. 14" NEWTON, M.D., BETTS, 9" stroke. No. 1042 BEMENT MILES. 72" MORTON draw-cut shaper, 18' travel.

MODERNIZED

MOTOR-DRIVEN

TURRET LATHES

No. 2-A WARNER SWASEY, 2-9/16" hole thru spindle, M.D.
No. 1-A WARNER SWASEY, M.D. Bar feed. 26" LIBBEY, 7½" hole in spindle.
18" LIBBEY, 3½" hole in spindle.
No. 4 WARNER SWASEY.
JONES LAMSON GD. HD., M.D. 2½"x24" & 3"x36". Bar Feeds and Chuckers.
No. 2 & 3 FOSTER; Nos. 2 & 3 WOODS.
4—No. 6-A P & J No. 2 B&O.
21" GISHOLTS, 3½" and 5" holes in sp.
28" NILES BEMENT POND, Gd. Hd. 4½" hole. AMERICAN hand turret lathe, 11/4" hole.

SCREW MACHINE

1½" FOOTE BURT SINGLE SPINDLE HYD.
Feed, Motor drive.
2" CLEVELAND MODEL "A"
2½" GRIDLEYS 1 spindle (2)
No. 55 NATIONAL ACMES
9/16" DAVENPORT, 5 sp. AUTO. M.D.
No. 652 NEW BRITAIN CHUCKER
Nos. 2 & 3 MANVILLE wood screw machines.

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14"x6" ROBBINS GEARED HEAD ROOM LATHES. NO PRIORITY RE-TOOL TOOL ROOM LATHES. NO PRIORITY RE-QUIRED.
30"x17' AMERICAN GD. HD., M.D.
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22"x12' AMERICAN, 16"x6' SOUTH BEND.
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30' PIT LATHE, Face plate 156". 14"x5'
Champion.
14"x4' LODGE SHIPLEY. 16"x5' ROCKFORD.

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AMERICAN Univ., 15" col., Box table, M.D. AMERICAN, 14" col., M.D. FOSDICK, Box table, 12" col., M.D. AMERICAN TRIPLE PURPOSE, M.D. CINCINNATI BICKFORD motor on arms. 6' DRESES, 4' & 3' FOSDICKS.
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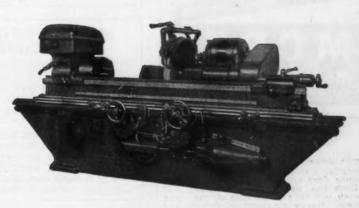
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LeBLOND 17"x6' Rapid Production Lathe with turret att.—M.D.

N.B.P. 48"x36"x14" Planer; 3 heads; box table; belt drive

GRAY 72"x48"x12' Planer-two heads; belt drive

HAMILTON 42"x42"x20' Planer; 3 heads; DC motor drive

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AMERICAN 3' Radial Drill - motor on arm; triple purpose

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G & E 36" Gear Hobber; M.D. ESPEN LUCAS No. 138 Cold Saw -Cap. 12"

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No. 5 Cincinnati Plain Mill, S.P.D. 18" Libby, 5" hole in spindle, M.D. No. 21/2 Bath Grinder.

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9" Pratt & Whitney Gear Grinder, M.D. 11" Gleason Bevel Gear Generator #64 Fellows Gear Shaper, M.D. Cimatool Gear Chamfering Machine, M.D. Lees-Bradner Gear Grinder

SHAPERS—PLANERS

18"x18"x 4' Whiteomb Planer 36"x36"x 8' Woodward & Powell Planer, Rev. M.D. 36"x48"x12' Cincinnati Hypro Planer, 4 hds.

MILLERS

4/4x12" Pratt & Whitney Thread Millers
Model L.T. 6"x36" Lees-Bradner Thread Miller,
Latest Type
No. 25-B Defiance Hor. Bor. Mill 3\%" Bar, New
1941

1941
No. 1—12" and 1—18" Cincinnati Plain Automatic
Millers, Latest Type
No. 2 Cincinnati Vert. Miller, Dial Type
No. 2-3-4 Plain & Vert. Cincinnati High Power
Millers, M.D.
New No. 3 Wigglesworth

GRINDERS

IG"x216" Landis Pl. Grinder—Latest Type
No. 35 Gallmeyer & Livingston Hydraulic Surface
Grinders, Latest Type
10"x120" Norton Pl. Grinders—Latest Type
10"x120" Norton Pl. Grinder, M.D.
12"x120" Landis Pl., M.D.
No. 10 B. & S. Plain Grinder, M. D.

LATHES—TURRET LATHES

6"x6¾ Goss & DeLeeuw Chucking Machine 1¾" 4-Spdl. Model G Gridley, M.D. 2½" Cleveland Medel A No. 3A Warner & Swasey 4½" Bar Stock, Late Type

MISCELLANEOUS

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195 Bent Street, Cambridge 41, Mass.

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Lempco Grinder, like new. #2 Kempsmith Universal Miller.

28th Street & A.V.R.R.

Cleveland 3¼" automatic, rebuilt, 1-spindle, with collets and pads; square pan.

CYLINDRICAL GRINDER

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12"x72" Cincinnati Plain Cylindrical Grinder, No. 11 B&S centers, 24 work speeds, 12 table speeds, 2"x17" grinding wheel. With 8 steady rests, 6 leveling blocks, center grinding attachment, pump, tank and piping, and motor controls. Main drive 20 H.P., 230 V D.C. motor. Headstock motor 1½ H.P., D.G., A-1 condition. Immediate delivery. BORING MILL, 24" Bullard, "New Era", M.D. BORING MILL, 60" Gishoft, 2 heads, R.P.M. BORING MILL, 60" Gishoft, 2 heads, R.P.M. BORING MILL, Horiz. Barrett, bar 5"x20" leng BUFFERS, Gardner 4 H.P. 230 Volts D.C. DRILL, 6 spindle Moline Heavy Hole Heg DRILLS, 513 & 416 Baker, No. 9, M.T., M.D. DRILL, Radial, 5' American Plain T.A., M.D. DRILL, Radial, 6' Niles Universal, M.D. GEAR CUTTER, spur 40" G & E, S.P.D. GEAR PLANER, bevel 54" Gleason, M.D. GRINDERS, vert. surface Springheld 75"x15" GRINDERS, plain Cylindrical 6"x32" Norton HAMMERS, steam forging 1100 lb. N.B-P LATHE, 26"x12" Prentice, heavy duty, T.A., D.B.G., B.D. MILLER, vert. plain 2½-B Milwaukee, M.D.

LATHE, 26"x12" Prentice, heavy duty, T.A., D.B.G., B.D.

MILLER, vert. plain 2½-B Milwaukee, M.D.

OUTBOARD SUPPORT, 5½-Bar Heriz. Mill PLANER, 24"x24"x8" Powell, 1 Head, M.D.

PLANER, 50"x50"x16" Detrick-Harvey, 2 heads, M.D.

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SHEAR, squar. 44"x3/16" American, M.D.

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SLOTTER, 20" Newton, table 38" dia., P.F., B.D.

STRAIGHTENER, tube Torrington, 5%" O.D.

STRAIGHTENER, 15 at H&J 84"x84" hot

STRAIGHTENER, Plate H&J 84"x84" hot

STRAIGHTENER, 15 Roll Sutton 5%" to 1½" bars, 5%" to 2" tubes, M.D.

SWAGING MACHINE, rotary 3-A Standard TURRET LATHE, 34" Gisholt, "K", H.S. 4½", M.D.

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Jeffrey Hammer Mill type 3-B 20x12. 24" Cincinnati Crank Shaper B.G. 14" x 6' American High Duty Lathe, rebuilt with Lima drive.

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No. 4 Portage horizontal Boring, Drilling & Milling Machine 5' American Plain Radial Drill

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Automatic Screw Machines

ROWN & SHARPE No. 0, 2 acts. scrow caschines, M.D.

NEW BRITAIN %", I", 1%", six spindle cuts.

M.D.

NATIONAL ACME No. 52 four spindle M.D. (4)

CLEVELAND % Model A single spindle

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Cloveland 2½" Bar Horiz. Universal 3½" Bar Horiz. Bertram 42" Vertical

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Lapointe #4W Hydraulic

Niles 7' Radial Cincinnati-Bickford 5', 6' Radials Pratt & Whitney Gun Barrel Drills & Riflers

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Brown & Sharpe #3-26" Fellows #64 Fellows Gear Burnisher Gleason 6" Generator

GRINDERS:

Norton 6x32, 10x24, 18x96 Baxter D. Whitney #23 Cylinder Grinder. Like New Brown & Sharpe #11 Plain Brown & Sharpe #3 Univ. Bath 10"x25" Univ. Cincinnati 12"x36" Univ. Bryant #3B, 6, 12, 18 Internal P & W 14" B.B. Vert. Surface Farrel Roll Grinder

Monarch & LeBlond 14"x6'
Sidney 18"x8'
Lodge & Shipley 20"x8' Selective G.H.
Johnson 30"x24'
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McCabe 33"x55"x10\/2'—Two in One
Sundstrand M.D. Stub
Lo-Swing 4"x60", 3\/2"x108"
J. & L. 2\/4x24, 3x36 Flat Turret

MILLERS:

Van Norman #2 Duplex
Cincinnati #3, 4 Plain SPD
Milwaukee #1½B Vertical
Becker #4B Vertical
Cincinnati #4 Vertical SPD
B&S #3 Vertical SPD
P & W 6x48 Thread Miller
Hanson-Whitney Thread Miller
Rowbottom Cam Millor
Pratt & Whitney 2" Spline Duplex
Pratt & Whitney 4" Spline Duplex Millors Cincinnati 12" B.G. Mfg. Becker #7H Lincoln

MISCELLANEOUS:

Boring Machine—Coulter Diamond Borer Chambering Machine—Pratt & Whitney Chucking Machines—Potter & Johnston #6-C Hammers—Helve Hammers—Helve Hammer—Beaudry #6-150 Lb. Power Honing Machine—Gariin Model MCV, New Keyscater—Mitts & Merrill #3 Shoar—Marshalltown #88 Rotary Bevel, M.D. Tapper—Threadnut #2 Upsetter—Acme 2" Steel

PLANERS.

LAPERD3.
Whiteomb 22"x22"x5'--24"x24"x6'
American 28"x26"x8'
Cinelnnati 30"x30"x10'
Cinelnnati 36"x36"x20'
Cinelnnati 36"x36"x20'
Cinelnnati 36"x36"x20'
Cinelnnati 36"x36"x20'
Cinelnnati 36"x36"x20'
Cinelnnati 48"x48"x20'-3 head
Gray 48"x2"x18'
Head Planer

Head Planer

4 Head

Complete Geared 105

PRESS-Ferracute #DGGF 56 Double Geared 105 ton cap. 36" Stroke, Weight 36,000 lbs., New 1939

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No. 1 Sutton Cross Roll Straightener, under drive type. Capacity, bars $\frac{1}{2}$ " to $\frac{1}{2}$ " dia., tubes to 2" in dia.

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IN STOCK

AUTOMATICS

7/s" Cleveland Model M, four spindle 134" Gridley Model G, four spindle 31/4" Cleveland Model A, single spindle

BROACHES

No. 4 LaPointe, m.d. 15 Ton Hercules, m.d.

DRILLS

30" Hamilton Upright, p.f.
24" Superior Upright, p.f.
3' Prentice Radial, s.p.d.
4' Dresses Radial, s.p.d.
No. 310 Baker, single spindle
24" Barnes Camelback, single spindle
Avey Sensitive, four spindle
Leland-Gifford, Sensitive, three spindle
No. 11 Natco Multiple Spindle
No. 14 Natco Multiple Spindle

GEAR CUTTERS

No. 12 Barber-Colman
No. 6 Fellows Gear Shaper, m.d.
30"x10" Maag Gear Shaper, m.d.
No. 3 Brown & Sharpe Automatic Gear
Cutter 30" Consolidated Gear Tooth Rounder 96" Gleason Spur & Bevel Gear Planer

GRINDERS

No. 2 Cincinnati Centerless
No. 72A3 Heald Gagematic
No. 75 Heald Internal
No. 70 Heald Internal
No. 3 Landis Universal
30" Diamond Face, 84" table travel
No. 2 Wilmarth & Morman Surface
No. 12 Brown & Sharpe Cutter

LATHES

14" x 6' Lodge & Shipley, g.h.
14" x 10' Pratt & Whitney, c.d.
16" x 10' Monarch, g.h.
18" x 6' Lodge & Shipley, g.h.
20" x 8' Lodge & Shipley, c.d.
22" x 10' Lodge & Davis, c.d.
29" x 14' Schumaker, Boye & Emmes, c.d. 8" x 60" Fitchburg Lo-Swing, g.h.

TURRET LATHES

24" Bullard New Era V.T.L., m.d.
12" Bullard Mult-au-Matic, m.d.
No. 4A Warner & Swasey, 7¾" Hole,
Timken
No. 1B Foster, m.d.
2¼" x 24" Jones & Lamson, M.D.
(serial over 40,000)
No. 4 Warner & Swasey, c.d.
No. 1-SP Garvin, c.d.

MILLS

No. 20 Van Norman Duplex, m.d.
No. 1M Cincinnati Universal, m.d.
No. 2 Milwaukee Plain, c.d.
No. 3 LeBlonde Plain, c.d.
No. 3 Brown & Sharpe Vertical, m.d.
Model C Becker Vertical, m.d.
Model B Gooley & Edlund, c.d.
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3	50	G. D.	1	KHA	13800x115/230
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(3)	1	Shepard	230-VDC.	one	Var. Sp.
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(2)	1	Euclid	115-VDC.	one	Single Sp.
(1)	1	Cleveland			
		Tramrail	230-VDC.	two	FL. OR CG. OP.
(1)	4	Shepard	230-VDC.	two	FL. OR CG. OP.
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(1)	21/2 2 3 5 6 6/4 7/9-1/4	G. E.	C.O1805 . :	1150
(2)	61/4	Westgahe	K-3	725
(3)	7/9-1/2	C. W.	A.W1	700/580
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(1)	10/7	C E	M.D102	800/1025
(1)	10	Westgshe	K-4 B.W. K-5	690
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(1)	25/20	Westgshe		
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(2)	20/30	G. E.		
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(1)		C. W.	D.W.	620/520
(1)	50	G. E.	C.O.—1810 C.O.—1830	725
(2)	65/85			
(1)			C.O.—1811	
(18)	Westgs	he Armatur	es K-3-4-5-6-7-8	& 9

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TRY US WHEN OTHERS FAIL!

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ABANDONED PLANTS, MACHINERY & EQUIP-

MENT SCRAP-IRON; plain, nickel, tungsten, etc. IRON & STEEL PRODUCTS, INC.

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39 years' experience 13496 S. Brainard Ave., Chicago 33, Illinois SELLERS BUYERS TRADERS

FOR SALE

WALL WELDED STEEL **TUBING SAE 1010**

3,250 ft. 34" o.d. x 14 ga.
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1,050 ft. 3¼" o.d. x 11 ga.
3,100 ft. 1¾" o.d. x 14 ga.
900 ft. 2" o.d. x 14 ga.
200 ft. ½" o.d. x 14 ga.
200 ft. ½¼" o.d. x 13 ga.
1,750 ft. ½¼" o.d. x 13 ga.
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14,000 ft. ½" x 1" x ½% x 1.78# Channels
3,750 ft. 1½" x ½ x ½ x 1.04# Channels
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New Surplus Pipe & Tubes Steel Buildings **Tanks** Valves and Fittings Plates, Bars &

JOS, GREENSPON'S SON PIPE CORP. Natl. Stock Yds., St. Clair Co., III.

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2-Frick water-cooling units, stainless steel cooling tanks, size 3"x3". Should be shipped to factory for general overhauling. Bargain prices to move.

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For the duration or post war — Save demurrage, switching, extra handling costs, damaging foreign cars, etc.

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* * *

90, Hopper, Double, 50-Ton
10, Hopper, Side-Discharge, 50-Ton
150, Refrigerator, 40-Ft., 40-Ton
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17, Ballast, Composite, 50-Ton
25, Box, 36-Ft., 40-Ton; Steel Ends
All cars are priced to self:

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New & Reconditioned ALL SIZES for ALL PURPOSES Cut and Threaded to Your Specifications VALVES AND FITTINGS UNITED PIPE & SUPPLY CO., NORRISTOWN, PA.

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-20 ton Vulcan, standard gauge, Gasoline. Rebuilt.

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Phila. 2, Pa.

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For Sale, located at Standish, New York Railroad scale, Fairbanks, 300,000 lb. capacity, registering beam, serial #E801050, type P-12-75. Equipped with dead rail, platform length 54 Ft. Jaw crusher, all steel frame, size 10"x12". Structural steel building, 60x30 ft., 15 ft. high, corrugated steel sides and roof.

FOR SALE

FOR SALES

at Bargain Prices

25 Ten 2 7/16" Used Lineshaft 10'-20'

5 Ten 4 15/16" Used Lineshaft 10'-20'
10 Ten 25/215/32%" New Channel

5 Ten 15/16" CR Hex. B 1112 Randes BARON STEEL COMPANY

JALVES and FITTING
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4075 Detroit Ave., Toledo 12, Ohlo

FOR SALE

150 tons 5" Channel 250 tons 5" | Beams

Approximate length II ft. 100 ton of above sizes in lengths 41/2" to 10". Standard weight material, all straight lengths, ne holes.

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25 Pcs. 16" Girders 35'0 long 45 Tons No. 12 Gauge Sheets (Large) 500 Pcs. 6" Channels, 9'0

QUEENSBORO STRUCTURAL STEEL CO. Long Island City 1, New York



THE CLEARING HOUSE

LOCOMOTIVES

I—7-Ton Gas Locomotive, 36" Ga., Milwaukee Locomotive Works
I—9-Ton Gas, 36" Ga., Whitcomb
I—8-Ton 0-4-0 Yulcan, S/G. Ex. Cond.
2-25-Ton 0-4-0 Porter Saddle Tank Locos. Oil burners; A.S.M.E. Code, Excel. Cond.
I—50-Ton 0-6-0 Yulcan Locomotive
I—65-Ton 2-6-0 Magul Loco. Oil-burning
3—70-Ton 0-6-0 Baldwin Switching Locos. ICC condition

condition

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from 5 Warehouses

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• TRACKAGE SPECIALISTS EVERYTHING FROM ONE SOURCE

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35-40 ton steel u/f flats.
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20-30 ton steel u/f box cars.
23-50 ton all-steel Gons.
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LOCOMOTIVE CRANES Saddle Tank Locomotives

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Complete Stocks at 90# 85# 75# 70# 65# 60# and lighter weights, with angle bars, carried at principal points throughout the country, available for rail or water shipment.

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All sizes and weights. Also frogs, switches spikes, bolts, tie plates, contractors' armine equipment carried in stock.

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FOR SALE

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25—4'-0 Built up Girders 39'0" long
50—24" Built up Girders 28'4" long
40—18" Built up Girders 23'8" long
30—28" Built up Girders 29'5" long
30—30" Built up Girders 28'5" long
30—30" Built up Girders 28'5" long
SED STRUCTURAL STEEL AND PLATES
FRITZ STEEL CORP.
arry Street
Bronx, N. Y.

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RAIL-ACCESSORIES RAILWAY EQUIPMENT

BOUGHT SOLD . DULIEN STEEL PRODUCTS, Inc.

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WANTED

FOR IMMEDIATE ESSENTIAL USE

1-10 Ton Overhead Crane-50' Span-220 Volt, A.C. Operation Also

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Please quote on any machines approximating the above specifications by wire or air-mail.

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SSES: — Inclinable — Double Crank and Straight Side-All Sixes PRESSES: WELDERS:—Spot-Butt and Seam
SQUARING SHEARS AND PRESS BRAKES

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"METAL WORKING MACHINERY"
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WANTED — National, 3/16" long stroke, Rivet Header or equivalent. Immediate delivery. Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.

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IRON & STEEL PRODUCTS, INC.

39 years' experience 13496 S. Brainard Ave., Chicago 33, Illinois Phone: BAYport 3456

WANTED

Portable Sand Blasting Machine
Gasoline Engine or Electric Motor Drive
Mounted on 4 Wheel Truck with
All Accessories.

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39 HYATT AVE., NEWARK 5, N. J.
EMIL A. SCHROTH, OWNER. MITCHELL 2-3536

Highest Prices Paid

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POWER BRAKE

8'0" or 10'0" Long 3/8" or 1/4" Capacity

ADDRESS BOX B-551
Care The Iren Age, 100 E. 42nd St., New York 17

SURPLUS MATERIAL WANTED

4" and 5" tubes, 14 gage sidewall preferred; 14 and 16 gage black sheets, 28 gage galvanized sheets, 24" and wider preferred.

Siebring Manufacturing Company George, Iowa

WANTED!

15-20 to 30 cu. yd. Dump Cars, drop-door type IRON & STEEL PRODUCTS, INC.

39 years' experience

13496 S. Brainard Ave., Chicago 33, Illinois "ANYTHING containing IRON or STEEL"

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For Machine Screw Nuts by a Midwestern City Manufacturing Company.

BOX NO. 775S-A. Care The Iron Age, 1134 Otts Bldg., Chicago 3

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When you are in the market for something that's hard to locate, advertise for it here. It's a quick and almost sure way to find what you want.

BUSINESS OPPORTUNITIES

NEW PRODUCTS WANTED

Modern Brown & Sharpe Automatic Screw Machine Shop wants new products or inventions for postwar market. Our equipment is new and we have the necessary machinery to complete the product within our own plant.

We will welcome all inquiries.

CHAMPION GAUGE & TOOL CO. 4465 Cass Avenue Detroit 1, Michigan

WILL LICENSE ON LOYALTY BASIS

Governors for Gas and Diesel Engines, new and improved method mechanical and electrical operated. Engine speed and road speed governed separate.

HOPPE ENGINEERING COMPANY GREENSBORO, INDIANA

NEW INVENTIONS WANTED

Mechanical and electrical devices for postwar manufacture and sale. Either new or improvements upon present methods.

P. O. Box 217, Denville, N. J.

180-THE IRON AGE, June 29, 1944

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HELP WANTED

ANNOUNCING

Appointment of the

BUREAU PERSONNEL ADVANCEMENT

as Exclusive United States Employment Agent for a New South American Steel Company

We are grateful for the high recognition and confidence expressed by the executives of this company in making this appointment. Another conclusive proof of the integrity, dependability and effectiveness of this executive placement service.

WE ARE LOOKING FOR IMMEDIATELY:

(Other positions to be advertised later)

CHIEF METALLURGIST. Salary—up to \$12,000 (Plus 3-yr. renewable contract. Plus traveling expense for man and family, plus rent

Under 45. College graduate with Doctor's or Master's Degree in ferrous metallurgical engineering or metallurgical chemistry. Experience minimum 10 years in steel mill chemical and metallurgical laboratories and minimum 5 years in charge metallurgical and chemical research operations.

SUPERINTENDENT OF MAINTENANCE. Salary—up to \$10,000 (Plus 3-yr. renewable contract. Plus traveling expense for man and family, plus rent free home).

Under 45. Graduste mechanical engineer. At least 15 years' general steel mill engineering, maintenance in a steel plant. Five years as Chief Engineer or Maintenance Superintendent. Good organizer and experienced on maintenance and repair cost control.

POWER PLANT SUPERINTENDENT. Salary—up to \$7200 (Plus 3-yr. renewable contract. Plus traveling expense for man and family, plus rent free home).

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PERSONNEL ADVANCEMENT BUREAU

Executives Exclusively

Write AD LEONARD, President, Grant Building, Pittsburgh, Pg.

EXECUTIVES AND TECHNICAL MEN DESIRING POSITIONS WITH POSTWAR STABILITY

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HELP WANTED

EXPERIENCED RAIL STEEL MAN—West Coast rerolling mill. Statement of availability required. Address Box B-586, care The Iron Age, 100 E. 42nd St., New York 17.

FITTER—Fabricating plate shop, heavy material. Apply by letter, stating experience. Statement of availability required. Address Box B-591, care The Iron Age, 100 E. 42nd St., New York 17.

ROLL OPERATOR—Fabricating plate shop, heavy material. Apply by letter, stating experience. Statement of availability required. Address Box B-590, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

WANTED

STEEL MILL GENERAL SUPERINTENDENT

For Hot and Cold Rolled Strip Mills also must have experience in the Rolling of Stainless Steel. Excellent opportunity for the right man. Replies confidential. Statement of availability required.

ADDRESS BOX B-592
Care The Iron Age, 100 E. 42nd St., New York 17

WORKS MANAGER OR FACTORY SUPER-INTENDENT for long established New England concern, manufacturing special machinery. Must be thoroughly experienced in modern shop organization, production methods and cost control. Ability to get effective results from 150 employees under congenial conditions. Submit past record and recent snapshot. Excellent future for right man. Statement of availability required. Address Box B-570, care The Iron Age, 100 E. 42nd St., New York 17.

DRAFTSMAN-ENGINEER — Duties to include designing of die casting dies and fixtures for progressive manufacturing plant located in New York City, established over 25 years. Permanent post war position. Excellent future. Give full details of experience and salary desired to start. Statement of availability required. Address Box B-419, care The Iron Age, 100 E. 42nd St., New York 17.

ENGINEER

Mechanical Engineer experienced in steel plate and tank fabrication, particularly in design and construction of dies for forming and drawing steel plate 10 ga. to 3/4" in hydraulic presses. Exceptional opportunity for permanent position with long established concern located in Southern California. Statement of availability required.

ADDRESS BOX B-545 Care The Iron Age, 100 E. 42nd St., New York 17

REPRESENTATIVES WANTED

Nationally known manufacturer of precision tensile testing machines will appoint experienced sales representatives and jobbers in some territories. Write giving complete details of products now handled, qualifications, and other details. This is a widely advertised line and offers permanent connection to the right parties.

Replies held confidential.

ADDRESS BOX B-472

Care The Iron Age, 100 E. 42nd St., New York 17

HIGH GRADE AGENTS WANTED

We are looking for strictly first class representation by men with a proved record of performance and acceptance in their territories. Our present products include plug, ring and instrument gages, ground thread taps, various other perishable tools and machine tool accessories. We have a definite postwar product and merchandising program. All field efforts are supported by national advertising, direct mail campaigns and product catalogs. We prefer men with one or two related non-competitive lines and who are capable of both sales and service.

service.
If interested, write

RALPH KRAMER, Sales Manager N. A. WOODWORTH COMPANY

> 1300 E. Nine Mile Road Detroit 20, Michigan

DETROIT TOOL SHOP HAS OPEN CAPAC-ITY FOR MANUFACTURE OF DIES, JIGS, FIXTURES & SPECIAL MACHINERY. STRAIGHT 6% COMMISSION BASIS.

Statement of availability required.

ADDRESS BOX B-593 Care The Iron Age, 100 E. 42nd St., New York 17

TERRITORY AVAILABLE-We still have some open territory for experienced men to handle our nationally advertised machine tools, and at-tachments. Liberal commission. Write, giving lines now handled, qualifications, etc. Jefferson, 655-675 W. 4th Street, Cincinnati, Ohio.

THE IRON AGE, June 29, 1944-181

EMPLOYMENT EXCHANGE

REPRESENTATIVES WANTED

MACHINE AND TOOL SALESMEN

Exceptional opportunity for high grade experienced men to expand incomes handling high quality well known cutting oils and lubricants, in addition to their own line. Attractive commission. Write complete details.

ADDRESS BOX B-460
Care The Iron Age, 100 E. 42nd St., New York 17

ACCOUNTS WANTED

SALES REPRESENTATION STEEL, MINE AND MANUFACTURING INDUSTRIES BY ACTIVE AND SUCCESSFUL ORGANIZATION PITTSBURGH TERRITORY

ADDRESS BOX A-775 Care The Iron Age, 428 Park Bldg., Pittsburgh 22

WELL KNOWN AND REPUTABLE firm in Milwaukee area desires lines of Cutting or kindred tools as Manufacturers' Agent. Firm and personnel highly regarded by industrial trade. Address Box B-594, care *The Iron Age*, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

EXECUTIVE: THE WORKING TYPE. Young in years 47, old in experience, 25 years in iron and steel industry from operating dept. to front offices. Prefers commercial division. An organization man, thinks straight, plans effectively and efficiently. Employed but job isn't tough enough. Present salary over \$10,000.00. Address Box B-517, care The Iron Age, 100 E. 42nd St., New York 17.

WANT MORE PRODUCTION? Operating efficiency, improvements in jig, fixture, tool design, and shop methods, to compensate for unskilled labor. Draft exempt. Executive ability. Short term contract basis only. Can develop new products. Location immaterial. Address Box B-379, care The Iron Age, 100 E. 42nd St., New York 17.

OPERATING EXECUTIVE: 23 years' executive experience in steel mills and fabricating plants. Thoroughly qualified in operating procedures and administrative functions. Capable leader; qualified organizer. Under 50; University Graduate, Protestant, Satisfactory references. Address Box B-547, care *The Iron Age*, 100 E. 42nd St., New York 17.

SALES EXECUTIVE. Capable Salesman, Engineer, Organizer; 15 years as Machine Tool Salesman, Dealer, Plant Manager. Can get results. Address Box B-313, care The Iron Age, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

METALLURGIST - ENGINEER—Desires position as Chief Metallurgist or Metallurgical Engineer with definite post-war future. B. S. Degree in Metallurgical Engineering. Experiences: Maintenance Metallurgical Engineer, Purchasing, Open Hearth Metallurgist, Bessemer Metallurgist, Rolling Mill Metallurgist, Pipe Manufacture, Metallography, Statistics. Age 30 yrs. Occupationally deferred. Address Box B-541, care The Iron Age, 100 E. 42nd St., New York 17.

STAFF MASTER MECHANIC and GENERAL PRODUCTION SUPERINTENDENT available as Production or Factory Manager, 20 years' experience in diversified industry, first hand knowledge mass production, machine tooling, tool engineering, plant engineering, sheet metal stampings, production control, planning, scheduling, purchasing. Now employed at salary \$10,000. Wishes to contact companies in need of such calibre man for present and post war planning. Age 40. More information upon request. Address Box B-558, care The Iron Age, 100 E. 42nd St., New York 17.

WORKS MANAGER-SUPERINTENDENT: Seasoned executive—draft exempt; production mechanical background manufacture stampings; screw machine products; castings; forgings; dies; tools; heavy-light assemblies. Experienced handling organized labor—contracts; negotiations; arbitration; grievances to satisfaction Management and Labor. Address Box B-543, care The Iron Age, 100 E. 42nd St., New York 17.

MECHANICAL ENGINEER AND DE-SIGNER—20 years' experience with hydraulic and industrial manufacturers as head designer, chief engineer and assistant sales manager. Married; age 58; English ancestry; U. S. citizen. Mechanical Engineering Degree—Sheffield University, England. Available at once. Address Box B-589, care The Iron Age, 100 E. 42nd St., New York 17.

HAMMERMAN experienced on light and heavy forgings Press or Hammer. Supervisory position, or would consider training men. Address Box B-553, care *The Iron Age*, 100 E. 42nd St., New York 17.

FORGE SHOP SUPERVISOR—young, progressive, backed by 10 years experience on open die presses to 2500 tons. Address Box B-573, care *The Iron Age*, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

SALES EXECUTIVE, EXPERIENCED ALL PHASES SALES, INCLUDING CATA. LOGUE, DESIRES POSITION WITH MANU. FACTURER OF HEAVY METAL PRODUCTS SUCH AS LOGGING, CONSTRUCTION, OIL FIELD, AGRICULTURAL TOOLS OR EQUIPMENT. 15 YEARS PERSONAL CONTACT WITH OUTLETS SOUTH AND SOUTHWEST. CAN HANDLE ALL WPB FORMS, EXPEDITING, PURCHASING UNTIL POST WAR. COLLEGE DEGREE. BEST REFERENCES. ADDRESS BOX B-578, CARE THE IRON AGE, 100 E. 42ND ST., NEW YORK 17.

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MANAGEMENT EXECUTIVE available soon for permanent connection with established postwar industry. Responsible experience in business administration, organization, production and costa. University graduate. Commensurate salary. Address Box B-585, care *The Iron Age*, 100 E. 42nd St., New York 17.

WELDING ENGINEER—Young man with a prominent record of achievement in welding seeks wider scope and opportunities for his abilities. Broad experience in engineering development, radiographic inspection, jigs and fixtures, and production in the welding industry. Interested in designing and development of products for welding. Address Box B-562, care The Iron Age, 100 E, 42nd St., New York 17.

NATIONALLY published industrial color photographer and Advertising Manager of corporation with world wide distribution desires position with aggressive organization who is willing to compensate ability. Married, children, over thirty, now employed. Address Box B-555, care The Iron Age, 100 E. 42nd St., New York 17.

MECHANICAL ENGINEER, age 30, desires position with industrial engineering firm or with firm having post-war future. Now employed as Ass't Chief Engineer. Steel mill, machine tool, machine shop and forging experience. Foreign assignments or traveling acceptable. Address Box B-571, care The Iron Age, 100 E. 42nd St., New York 17.

WIDELY KNOWN CONSULTANT WISHES to reenter industry as chief metallurgist or executive in quality control or research department of responsible metal industry. Ferrous or nonferrous. Address Box B-531, care The Iron Age, 100 E. 42nd St., New York 17.

Rates for Employment Service, Help, Representatives, Accounts and Situation Wanted Ads

These advertisements go to press on Friday for the following week's issue.

Employment Service Rates
Help Wanted Rates
Representatives Wanted Rates
Accounts Wanted Rates

Situation Wanted Rates

Situation Wanted Ads Payable in Advance

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ADVERTISERS IN THIS ISSUE

NCED CATA-MANU-PROIL TRUC-TOOLS ONAL WPB G UN-BEST CARE NEW

A	Cincinnati Grinders, Incorporated 63	Ġ.
Aaron Machinery Co 172, 174, 176	Cincinnati Shaper Co., The 4	Galbreath Machinery Co 176
Aircraft & Diesel Equipment Corp 114	Citron-Byer Co., The	Gardner Machine Co
Albert & Davidson Pipe Corp 179	Cleveland Steel Tool Co., The 166	Gates Rubber Co., The
Alien Property Custodian, James E.	Coast Metals, Inc	General Electric Co
Markham	Commercial Forgings Co 167	General Refineries, Inc
Allis-Chalmers Mfg. Co	Continental Foundry & Machine Co 91	General Utilities Corp 158
American Air Compressor Corp 177	Cooper-Bessemer Corp 6-7	Gisholt Machine Co
	Crawford, F. H., & Co., Inc 175	Glazer Iron & Metal Co 180
American Broach & Machine Co 95	Culvert Div., Republic Steel Corp 9	Gleason Works
American Chain & Cable Co., Inc10, 106	Cuyahoga Spring Co., The 166	Goodman Electric Machinery Co 178
American Foundry Equipment Co 114		Goss & De Leeuw Mach. Co 166
American Manganese Bronze Co 164	D	Granite City Steel Co 152
American Metal Products Co 107	Darwin & Milner, Inc	Great Lakes Steel Corp 22
American Nickeloid Co	Dean Hill Pump Co	Greenlee Bros. & Co
American Petrometal Corp	Delta Equipment Co	Greenpoint Iron & Pipe Co., Inc 179
American Spring of Holly, Inc 112	Designers for Industry, Inc	Greenspon's, Jos., Son, Iron & Pipe Co. 179
	Defrex Corp 129	Griffin Mfg. Co 165
Armstrong-Blum Mfg. Co 117	De Witt Tool Co 174	
	Diamond Mfg. Co 163	
В	Disston, Henry, & Sons, Inc 24	H
B. & R. Iron & Metal Co 179	Donahue Steel Products Co 176	Harnischfeger Corp
Barnes, Wallace, Co., Diy. Associated	Dony, D. E., Machinery Co 174	Harrington & King Perforating Co., The 166
Spring Corp 8	Dreis & Krump Mfg. Co 166	Harrison Abrasive Corp
Baron Steel Co 179	Drop Forging Association 147	Hayward Co., The
Bearings & Motive Specialties Co 178	Dulien Steel Products, Inc 180	Hendrick Mfg. Co
Belmont Iron Works 162		Hetz Construction Co
Belyea Co., Inc 177	E	Hill-Clarke Machinery Co170, 173
Berger Mfg., Div. Republic Steel Corp. 9	Earle Gear & Machine Co 160	Hobart Bros. Co
Bethlehem Steel Co	Eastern Machine Screw Corp., The 163	Holcroft & Co
Bixby, R. W., Inc 181	Eastman Kodak Co 137	Hoppe Engineering Co
Bohn Aluminum & Brass Corp 93	Electric Controller & Mfg. Co., The 113	Hoskins Mfg. Co Inside Front Cover
Botfield Refractories Co 168	Elox Corporation	Hyman, Joseph, & Sons
Botwinik Bros., Inc	Elwell-Parker Electric Co., The 150	Hyman-Michaels Co
Bradley, C. C., & Son, Inc 161	Elyria Belting & Machinery Co., The 174	
Brandt, Chas. T., Inc	Emerman Machinery Co	1
Brandt, W. E., Machinery Sales 176	Emsco Equipment Co	Indianapolis Machinery & Supply Co 175
Briggs Mfg. Co 156	Espen-Lucas Mach. Works, The 168	Industrial Brownhoist Corp 151
Broadway Bolt & Screw Co 180	Etna Machine Co., The	Inland Steel Co 30
Bullard Co., The 59		International Nickel Co., Inc., The 18
Bundy Tubing Co	F	Interstate Machinery Co., Inc 173
	Falls Clutch & Machinery Co., The 168	Iron & Steel Products, Inc.,
	Farval Corp	174, 177, 178, 179, 180
С	Federated Metals, Div. American Smelt-	
California Spring Co., Inc 161	ing & Refining Co	
Carboloy Co., Inc 65	Fellows Gear Shaper Co., The 163	Land & Lands Markin Co. 57
Carborundum Co., The	Fischer, Chas., Spring Co., The 162	Jones & Lamson Machine Co
Centre Trucking Co 178	Foote Bros. Gear & Machine Co 17	Jones & Laughlin Steel Corp 100-101
Champion Electric Motor Co 177	Fort Pitt Malleable Iron Co 169	
Champion Gauge & Tool Co 180	Fosdick Machine Tool Co., The 67	К
Champion Sheet Metal Co., Inc 169	Foster, L. B., Co., Inc	Kamis Engineering Co 174, 175
Cherry Rivet Co	Frank, M. K	Kennametal, Inc
Chicago Perforating Co 160	Frankel Company, Inc 179	Ken-Tool Mfg. Co., The 165
Cincinnati Bickford Tool Co., The 164	Fritz Steel Co	Key City Bolt & Spike Works, Inc 167

ADVERTISERS IN THIS ISSUE

Kidd Drawn Steel Co 165	0	T
Kingsbury Machine Tool Corp 161	Ohio Locomotive Crane Co., The 169	Taylor-Wilson Mfg. Co 169
Knox, Earl E., Co 177	Ohio Steel Foundry Co., The Front Cover	Thomas Flexible Coupling Co 131
	Ott Machinery Sales, Inc 175	Titan Metal Mfg. Co 102
L	Ottemiller, Wm. H., Co., Inc 166	Tomlinson & Co
L. & J. Press Corp		Torrington Co., The
Land, L. J., & Co	P	Towmotor Corporation
	Pangborn Corporation Inside Back Cover	Tractor & Equipment Co 178
Landis Machine Co	Parker Rust Proof Co 144	Trico Products Corp 162
Lang Machinery Co	Payne, N. B., & Co., Inc 178	Truscon Steel Co 9
Lansing Stamping Co	Peoria Malleable Castings Co 168	Turner Gauge Grinding Co 104
Leach, H., Machinery Co 166	Personnel Advancement Bureau 181	
Leahy, John W	Peters & Russell, Inc 176	U
Le Blond, R. K., Machine Tool Co., The, Back Cover	Phillips, C. E., & Co	Union Drawn Steel Div., Republic Steel
Leland-Gifford Co 169	Platt Bros. & Co., The	Corp 9
Loftus Engineering Corp	Pyrolectric Co, The	United Engineering & Foundry Co 15
Lovejoy Flexible Coupling Co 168	The same and the s	United Pipe & Supply Co
Lucas Machine Tool Co., The 162	0	United Welding Co., The
Lunney, Frank J	Queensboro Structural Steel Co 179	Universal Boring Machine Co 165
camey, Frank 3	¥200112210 0110101101 0101 11111	Universal Engineering Co 160
	R	
М	Rail & Industrial Equipment Co 179	٧
MacCabe, T. B., Co 178	Reid-Avery Co., The	V & O Press Co., The
MacWhyte Co	Remington-Rand, Inc	Vascoloy-Ramet Corp 167
McCaffrey-Ruddock Tagline Corp 166	Republic Steel Corp 9	Vermont Marble Co
Manhattan Rubber Mfg. Div. of Ray- bestos-Manhattan, Inc 139	Ritterbush & Co., Inc 170	Viener, Hyman & Sons
Mercer-Robinson Co., Inc 165	Robbins & Meyers, Inc	w
Metal Carbides Corp 169	Rockaway Rolling Mill	Walker-Turner Co., Inc
Miles Machinery Co 172	Rockford Drop Forge Co 167	Walsh, Richard P., Co 178
Milford Rivet & Machine Co., The 177	Ryerson, Jos. T., & Son, Inc 28	Webb Wire Works
Molybdenum Corp. of America 136		Weiss, B. M., Co
Monarch Machine Tool Co., The 75	S	Western Wire Products Co
Morey Machinery Co., Inc 163, 174	Salkover Metal Processing Co., The 12	Westinghouse Electric & Mfg. Co 14
Morgan Construction Co 5	Schrader's, A., Son, Div. Scovill Manu-	
Morse Bros. Machinery Co 177	facturing Co	Wheeling Steel Corp. 168
Mundt, Chas., & Sons	Schulman, Albert	The state of the s
Murchey Machine & Tool Co 61	Sciaky Bros	Whitehead Stamping Co
	Seaboard Steel Co	Wigglesworth Machinery Co 174
	Seneca Wire & Mfg. Co., The 164	Woodworth, N. A., Co
N	Severance Tool Industries, Inc	Worcester Stamped Metal Co 165
National Business Bourse, The 181	Shore Instrument & Mfg. Co., Inc., The 168	
National Machinery Exchange 174	Siebring Mfg. Co	
National Steel Corp	Simmons Machine Tool Corp 172	CLASSIFIED
Newark Gear Cutting Machine Co 164	Standard Conveyor Co 130	CLASSIFIED
New Jersey Zinc Co., The 157	Stanhope, R. C., Inc	SECTION
New York State Department of Com-	Stanley Works, The 169	0_011011
merce 159	Stearns Magnetic Mfg Co 112	
Niagara Machine & Tool Works 138	Steel Conversion & Supply Co 164	Business Opportunities
Nicetown Plate Washer Co., Inc 176	Steel & Tubes Div., Republic Steel Corp. 9	Clearing House
Nicholson, W. H., & Co 161	Stewart Industrial Furnace, Div. Chi-	Employment Exchange
Niles Steel Products, Div. Republic Steel	cago Flexible Shaft Co 109	
Corp 9	Stone, R. J	Sub-Contracting—Parts and Sub-assemblies Made to Order,
Nilson, A. H., Machine Co 169	Stonhard Co	See First and Third Issues
Northern Engineering Works 73	Sun Oil Co	Wanted 180

184-THE IRON AGE, June 29, 1944

INSIDE FACTS

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Behind this section a centrifugal wheel throws abrasive against cleaned in drum

DRUM FOR TURNING WORK

Behind dust-tight housing a drum holding work rocks back and forth under blast area,' cleaning load quickly.

DUST-TIGHT DOOR FOR LOADING AND UNLOADING

The large dust-tight, counter-balanced door may be motor operated if desired.

LOADING SKIP

A simple, efficient, quickworking accessory to handle all types of work easily and economically.

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BARRELS TABLES CABINETS

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169

131

102

162

167

133 178 162

104

15

179

. 108 . 165 160

168

. 167

. 176

. 179

. 143 .: 178 167 18, 179

160

14

164

168

170-180

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